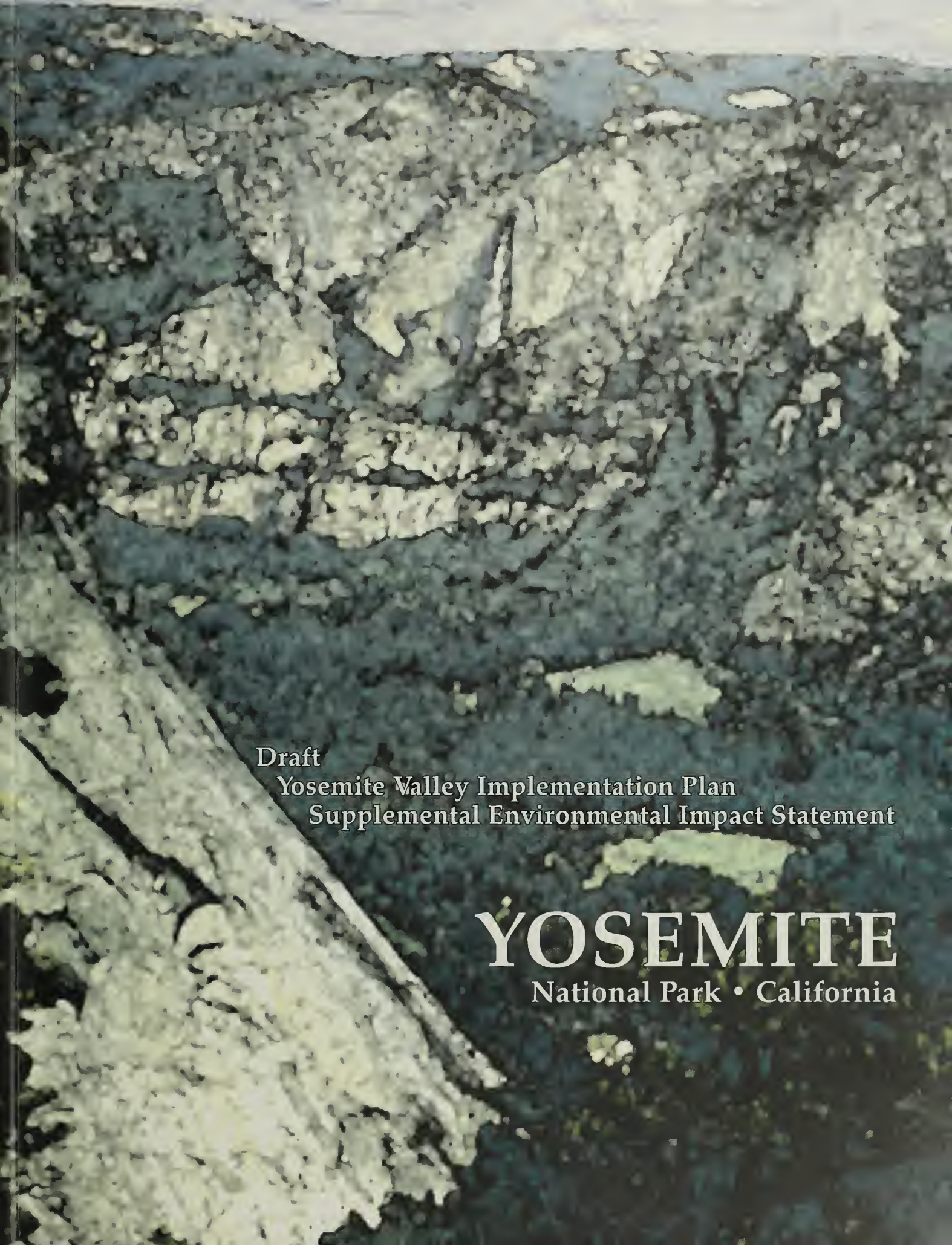


Draft
Yosemite Valley Implementation Plan
Supplemental Environmental Impact Statement

YOSEMITE

National Park • California

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Draft
Yosemite Valley Implementation Plan
Supplemental Environmental Impact Statement

YOSEMITE

National Park

Mariposa, Madera, and Tuolumne Counties
California

This *Draft Yosemite Valley Implementation Plan / Supplemental Environmental Impact Statement* presents four alternatives for carrying out the provisions of the 1980 *General Management Plan* (GMP). Those provisions call for the removal of unnecessary structures, restoration and protection of recovered land, relocation of facilities out of sensitive or hazardous areas, and reduction of traffic congestion in Yosemite Valley. This document incorporates the subsequent 1992 *Concession Services Plan* and 1996 *Draft Yosemite Valley Housing Plan* with the *General Management Plan* into a comprehensive implementation plan. Each alternative describes a proposal for the management and use of Yosemite Valley and discusses changes in the valley's developed areas, natural resource management, cultural resource management, interpretation and visitor services, and park operations.

Alternative 2 (the proposed action) would emphasize a comprehensive approach. Implementation of the proposed action would allow for approximately 147 acres in the east end of the valley to be restored to natural conditions, 82 acres redesigned, and 38 acres developed to accommodate relocated facilities or functions. An orientation / transfer facility would be located in the west end of the valley at Taft Toe. Day use visitors and out-of-park transit bus riders would be intercepted there and would use the valley shuttle bus system to access other destinations in Yosemite Valley. Changes to circulation and campgrounds are also proposed. Alternative 2 proposes an increase in interpretive and educational programs through partnerships with supporting organizations. Some cultural resources would be affected by the proposed actions.

Other alternatives include alternative 1 — no action, which continues implementation of the *General Management Plan* but without a comprehensive approach. Implementation of alternative 1 would allow for approximately 41 acres to be restored to natural conditions and 15 acres redesigned to accommodate relocated facilities or functions. Alternative 3 is similar to the proposed action but provides an orientation/transfer facility in the west end of the valley at Pohono Quarry. Implementation of alternative 3 would allow for approximately 143 acres to be reclaimed and restored to natural conditions, 93 acres redesigned, and 57 acres developed to accommodate relocated facilities or functions. Alternative 4 (minimum requirements) would provide for implementation of the *General Management Plan* in a manner more comprehensive than the no-action alternative but with less habitat restoration and fewer improvements than alternatives 2 and 3. Implementation of alternative 4 would allow for approximately 118 acres to be reclaimed and restored to natural conditions, 95 acres redesigned, and 36 acres developed to accommodate relocated facilities or functions.

The public review period for this document will end 60 days after publication of a notice of availability in the *Federal Register*. Comments or requests for more information should be addressed to:

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Yosemite National Park
P.O. Box 577
Yosemite National Park, CA 95389
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This document is available on the Internet at http://www.nps.gov/planning. Comments may also be submitted through the National Park Service planning page.


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SUMMARY

This *Draft Yosemite Valley Implementation Plan/ Supplemental Environmental Impact Statement* presents and analyzes four alternatives for carrying out the provisions of the 1980 *General Management Plan*. Those provisions called for the removal of unnecessary structures, restoration and protection of recovered land, relocation of facilities out of sensitive or hazardous areas, and reduction of traffic congestion in Yosemite Valley. Each alternative describes a proposal for the management and use of Yosemite Valley and discusses changes in the valley's developed areas, natural resource management, cultural resource management, interpretation and visitor services, and park operations. The document also presents a full discussion of the environmental impacts associated with implementing the alternatives.

Alternative 1, the no-action alternative, describes the conditions that would exist if actions recommended in the 1980 *General Management Plan*, the 1992 *Concession Services Plan*, and the 1996 *Draft Yosemite Valley Housing Plan* would continue to be implemented on a project-by-project basis without a comprehensive implementation program. Individual actions would be implemented as funding permitted. Interpretive and educational programs, visitor services, and new facilities would be provided as prescribed in these plans but without further coordination. Because implementation of current approved plans would be done on a piecemeal basis and without a comprehensive plan, the acreages to be developed cannot be reliably estimated.

Developed areas and facilities in Yosemite Valley would be retained as prescribed under previous plans. NPS and concessioner administrative facilities, major maintenance functions, and noncritical employee housing would eventually be removed from the valley. The valley campgrounds and the nature center at Happy Isles would be retained as visitor destination areas, and campsites and facilities damaged or destroyed by the January 1997 flood would be reconstructed as prescribed in previous plans. Implementation of alternative 1 would allow for approximately 41 acres to be restored to natural conditions and 15 acres redesigned to accommodate relocated facilities or functions.

Vehicle circulation in the valley would continue with use of the Northside and Southside Drive one-way loop and all valley roads and bridges. Both day users and overnight guests would continue to access the valley in their own vehicles, by tour bus, or by out-of-park transit vehicles. Parking for 1,271 day use vehicles would be retained in the valley, primarily at the Curry orchard parking area, Village Store parking lot, Camp Six, and along the circulation routes in the east end of the valley. Parking for 1,487 overnight guest vehicles would remain at lodging and campground areas.

A total of 32 acres of aquatic, riparian, and meadow communities would remain compromised by the impacts of development. An additional 153 acres would remain compromised as a result of flood-damaged infrastructure that precludes the restoration of natural communities. Four acres would be restored. Impacts on the river from inadequately designed bridges and other development would continue. Automobiles and buses would continue to have a serious negative effect on Yosemite Valley. Implementation would result in irretrievable loss of historic property (as called for in the *General Management Plan* and *Concession Services Plan*).

Alternative 2, the proposed action, is the NPS preferred alternative and draft plan. It would emphasize a comprehensive approach for carrying out the provisions of the *General Management Plan*, the *Concession Services Plan*, and the *Draft Yosemite Valley Housing Plan*. Specifically, this alternative calls for removal of unnecessary structures and circulation features, restoration and protection of recovered land, relocation of facilities out of sensitive or hazardous areas, and reduction of traffic congestion.

Alternative 2 proposes an increase in interpretive and educational programs through partnerships with supporting organizations and through new facilities that would provide improved information, orientation, and wayfinding services. Implementation of the proposed action would allow for approximately 147 acres in the east end of Yosemite Valley to be reclaimed and restored to natural conditions, 82 acres redesigned, and 38 acres developed to accommodate relocated facilities or functions; 21 acres in the west end of the valley would be developed.

The present visitor center would be removed, and the two auditoriums would be redesigned and remodeled to accommodate continued interpretive and educational uses. The village interpretive center/transit station in the former Village Store would serve as an information and interpretive center. Shuttle bus stops would be clearly identified throughout the valley.

Campground facilities damaged or destroyed in the January 1997 flood would be relocated to areas less prone to flooding; however, due to habitat constraints, the total number of available campsites would be 675 instead of 756 as prescribed in the *General Management Plan.*

Visitors would arrive at an orientation/transfer facility in the west end of the valley, at their lodging or campground, or in a gateway community and then move between destinations in the valley by shuttle bus, bicycle, or on foot. Day use visitor and out-of-park bus traffic would be intercepted at an orientation/transfer facility at Taft Toe. It is anticipated that a regional transportation system would eliminate the need for day use visitor parking at Taft Toe. If, by the summer of 2001, it does not, then a parking area would be created that would accommodate up to 1,800 spaces for day use vehicles. The size of the facility would be set by the capacity of the regional system. It could also provide parking for up to 120 backcountry vehicles and 20 tour buses. If parking were constructed the NPS would reevaluate the need for the spaces every two years and promptly remove unneeded spaces as the regional system matures. Parking for 2,300 day use vehicles would be removed from valley developed areas and roads. Parking for 1,440 overnight guest vehicles would remain at lodging and campground areas.

A total of 21 acres of aquatic, riparian, and meadow communities would be restored; six acres would be developed. Removal of three historic bridges would improve river hydrology more than any other alternative. Parking day use visitor automobiles in the west end of the valley and overnight visitor vehicles near lodgings would reduce congestion, air pollution, and noise and would improve the visitor experience. Implementation would result in an irretrievable loss of historic property throughout Yosemite Valley as called for in the *General Management Plan* and *Concession Services Plan.* Removal of three bridges and Curry orchard to remedy natural resource problems would result in an irretrievable loss of historic property. Natural resource impacts would increase in the west end of the valley because of development of the orientation/transfer facility at Taft Toe. Of the $75.4 million that the National Park Service would be expected to spend over five years, $63.3 million would directly impact the regional economy by creating 261 new jobs. The reduction in the number of campsites by 81 to 675 could result in lost visitor spending associated with excluded campers. These impacts would be somewhat offset by the greater construction expenditures associated with the reconfiguration of all valley camping.

Alternative 3 proposes actions similar to those described in alternative 2. This alternative calls for the removal of unnecessary structures and circulation features, restoration and protection of recovered land, relocation of other facilities out of sensitive or hazardous areas, and reduction of traffic congestion in the valley. It proposes an increase in interpretive and educational programs through partnerships with supporting organizations. There would be some new facilities that would provide improved information, orientation, and wayfinding services.

Alternative 3 proposes a lower level of redesign in Yosemite Village than alternative 2 and approximately the same level of redesign for campground areas, the Ahwahnee Hotel, and Curry Village. Implementation of alternative 3 would allow for approximately 143 acres in the east end of the valley to be reclaimed and restored to natural conditions, 93 acres redesigned, and 38 acres developed to accommodate new and relocated facilities or functions; 19 acres in the west end of the valley would be developed.

All of the campsites severely damaged in the January 1997 flood and in the river management zone would be removed and the areas restored to mixed conifer and riparian habitat. Due to habitat constraints, the total number of available campsites would be 675 instead of 756 as prescribed in the *General Management Plan.*

There would be two new visitor facilities: an orientation and transfer facility at the west end of the valley and a primary information center and shuttle bus transit station in Yosemite Village. The village information center/transit station in the former Village Store would provide park information and orientation programs. Two new amphitheaters in Upper and North Pines Campgrounds would be provided. The new amphitheaters would have a large enough capacity to accommodate visitors from all of the nearby campgrounds.

Auto touring in the valley would be replaced by guided tours, shuttle bus riding, valley floor tour, bicycle touring, and walking. Day use visitor and out-of-park bus traffic would be intercepted at an orientation/transfer facility on the north side of the valley near the former Pohono Quarry. All day use visitors would arrive by regional transit bus or leave their vehicles in a staging (parking) area and use the valley connector shuttle, a bicycle path, or foot trails to access Yosemite Village and other valley destinations. Vehicle access to the east end of the valley would be restricted to overnight lodging and campground guests (with reservations), and vehicles would be parked until departure. Parking for 2,300 day use vehicles would be removed from valley developed areas and roads. Parking for approximately 1,440 overnight guest vehicles would remain at lodging and campground areas.

A regional transportation system would eliminate the need for visitor parking at Pohono Quarry. If, by the summer of 2001, it does not, a parking structure sized by the capacity of the regional system would be constructed but would not exceed 1,800 day use visitor spaces and 120 backcountry vehicle spaces. Due to limited available land and steep terrain, a multilevel parking structure would be required. This facility would be terraced into the hillside and designed to accommodate interpretive functions relocated from the visitor center. If constructed, this facility would probably be permanent. Day tour bus parking would be located near Camp Six, south of Yosemite Village.

A total of 22 acres of aquatic, riparian, and meadow communities would be restored; six acres would be redesigned, and five acres would be developed. Removal of two bridges would improve river hydrology more than alternatives 1 and 4 but less than alternative 2. Parking day use visitor automobiles in the west end of the valley and overnight visitor vehicles near lodgings would reduce congestion, air pollution, and noise and would improve the visitor experience. Implementation would result in irretrievable loss of historic property throughout Yosemite Valley as called for in the *General Management Plan* and *Concession Services Plan.* Removal of two bridges and the Curry orchard to remedy natural resource problems would result in an additional irretrievable loss of historic property. Natural resource impacts would increase in the west end of the valley because of the development of the orientation/transfer facility at Pohono Quarry. Of the $204.9 million that the National Park Service would be expected to spend over five years, $172.1 million would directly impact the regional economy by creating 710 new jobs. The reduction in the number of campsites by 81 to 675 could result in regional impacts from lost visitor spending associated with excluded

campers. These impacts would be somewhat offset by construction expenditures.

In **alternative 4** actions recommended in the *General Management Plan,* the *Concession Services Plan*, and the *Draft Yosemite Valley Housing Plan* would continue to be implemented on a project-by-project basis. However, some comprehensive approaches would be implemented as funding permitted. Interpretive and educational programs, visitor services, and new facilities would be provided as prescribed in the previously approved plans. Alternative 4 proposes a lower level of redesign and change than alternatives 2 and 3. Implementation of alternative 4 would allow for approximately 118 acres to be reclaimed and restored to natural conditions, 95 acres redesigned, and 36 acres developed to accommodate new and relocated facilities or functions.

The intent of this alternative would be to improve the visitor experience in the valley while undertaking the fewest changes possible at the least cost. It emphasizes facility remodeling and renovation coupled with new and upgraded interpretation. No major new visitor or interpretive facilities would be planned in the valley, but at South, Arch Rock, and Big Oak Flat entrances, new facilities would be constructed to provide visit planning and information.

All of the campsites severely damaged in the January 1997 flood and in the river management zone would be removed and the areas restored to mixed conifer and riparian habitat. Campground facilities damaged or destroyed in the January 1997 flood would be relocated to areas less prone to flooding; however, due to habitat constraints, the total number of available campsites would be 662 instead of 756 as prescribed in the *General Management Plan.*

All employee parking and housing at Camp Six would be removed and the area restored to mixed conifer and riparian habitat.

All automobiles would be parked for the duration of any day visit. There would be pedestrian access to nearby destinations, but use of the shuttle system would be necessary to travel further. Automobiles belonging to campers and lodging guests would remain in campgrounds and lodging lots. Auto touring would be replaced by guided tours, shuttle bus riding, valley floor tour, bicycle touring, and walking.

Day visitors and out-of-park transit bus riders would park vehicles at one of several redesigned parking areas in the east end of the valley. Parking for 1,800 day use vehicles, 120 backpacker permit vehicles, and 20 day tour buses would be provided in the valley, primarily at Curry orchard, the Village Store, and Camp Six. Parking for 1,440 overnight guest vehicles would remain at lodging and campground areas.

A total of 17 acres of aquatic, riparian, and meadow communities would be restored; four acres would be redesigned, and five acres would be developed. Modification of two bridges would reduce a major constriction of the Merced River but would not substantially improve river hydrology. Continuing to park day use visitors' automobiles at three sites in the east end of the valley and overnight visitor vehicles near lodgings would reduce congestion, air pollution, and noise and would improve the visitor experience more than alternative 1 but less than alternatives 2 and 3. Implementation would result in irretrievable loss of historic property throughout Yosemite Valley as called for in the *General Management Plan* and *Concession Services Plan.* Activity and natural resource impacts would continue to be focused only in the east end of the valley because of retention of day use parking there. The National Park Service would be expected to spend $25.5 million more over its 10-year implementation period than in alternative 1 and would create 105 more new jobs than alternative 1. The reduction in the number of campsites by 94 to 662 could cause reduced visitor spending associated with excluded campers. These impacts would be somewhat offset by construction expenditures.

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PURPOSE OF AND NEED FOR THE ACTION

INTRODUCTION

In 1980, in a comprehensive planning process involving both the National Park Service and the public, three approaches were defined to ensure the long-term viability of Yosemite National Park's majestic valley. The resulting plan (the *General Management Plan*) called for a reduction in traffic congestion, removal of nonessential buildings and facilities, restoration of large areas of the valley to their natural conditions, and relocation of visitor and employee accommodations away from environmentally sensitive or dangerous areas.

The *General Management Plan* was created to preserve the natural resources that make Yosemite National Park a special part of the national park system. It was also formulated to enhance the experience of the millions of people who visit Yosemite Valley every year.

Seventeen years later, few goals of the *General Management Plan* have been fully realized. Traffic is still the greatest threat to enjoyment of the natural and scenic qualities of Yosemite. More than four million people visit the park annually — almost double the number of visitors in 1980. At peak times the number of automobiles in the park exceeds 6,000, which threatens the goals prescribed in the *General Management Plan.* And, as demonstrated by the disastrous 1997 flood, a significant number of facilities are still in dangerous floodplains. Critical transportation, lodging, and infrastructure problems in the valley, which threaten both the park's natural resources and the experience and enjoyment of its many visitors, are likely to become worse with time and more difficult to solve.

The National Park Service vision for Yosemite Valley includes more extensive meadows and fewer roads and buildings; it would be a place where people can walk, ride a bike, or make their way around without a car. The visitor experience should be dominated by the majesty of the valley without the distraction of traffic and parking. A more appropriate balance should be restored to the valley so that nature's wonders are not overshadowed by the intrusions of the modern world. Achieving the goals of the *General Management Plan* requires that bold steps be taken to enhance the experience and conserve the resources of a world class destination — Yosemite Valley.

The rationale for decision making at Yosemite National Park is based on the organic act of the National Park Service, the enabling legislation for the park, and the goals and objectives of the *General Management Plan.* Those goals and objectives are listed under "Relationships to Other Planning and Projects."

PARK PURPOSE

There are two purposes for Yosemite National Park. The first is preservation of the resources that contribute to Yosemite's unusual character and attractiveness — its exquisite scenic beauty; outstanding wilderness values; a wide range of Sierra Nevada environments, including the sequoia groves; the awesome domes, valleys, polished granites, and other evidence of the geologic processes that formed the Sierra Nevada; historic resources, especially those relating to the beginning of a national conservation ethic; and evidence of the American Indians who have lived in the area for thousands of years. The second purpose is to make the varied resources available for enjoyment, education, and recreation while leaving them unimpaired.

The first protection provided for Yosemite was through an act of Congress passed June 30, 1864 (13 Stat. 325). This act granted to the state of California the Yosemite Valley and Mariposa Big Tree Grove and stipulated that the land "be held for public use, resort, and recreation" and "be inalienable for all time." These areas were transferred to the federal government in 1906. An act of Congress, dated October 1, 1890 (26 Stat. 650), set aside Yosemite National Park to be administered by the secretary of the interior as a "forest reservation" to preserve all timber, mineral deposits, natural curiosities, or wonders in the park and retain them in their natural condition.

PURPOSE OF THE *DRAFT VALLEY IMPLEMENTATION PLAN*

The purpose of this *Draft Valley Implementation Plan* is to provide specific steps for carrying out the goals of the 1980 *General Management Plan*, including the removal of nonessential structures, restoration and protection of natural areas, relocation of facilities out of sensitive or hazardous areas, and reduction of traffic congestion. The implementation of these actions would significantly enhance the quality of the visitor experience and would help to ensure that the park's resources are preserved for future generations. The *Draft Yosemite Valley Implementation Plan* proposes a comprehensive approach with detailed actions and a phasing schedule to fulfill the goals of the *General Management Plan.*

The *General Management Plan* recognized that traffic congestion in the park was undermining the visitor experience and damaging fragile resources. Since the release of that plan the number of vehicles entering the park has grown dramatically, making congestion a common feature of the valley and perpetuating the need for an extensive network of roads, bridges, and parking areas. The resulting gridlock and parking shortages have eroded the quality of the Yosemite experience and compromised public use and enjoyment of the park. A primary aim of this *Draft Yosemite Valley Implementation Plan* is to propose alternatives that can effectively alleviate traffic congestion in the valley without unduly inconveniencing park visitors.

The *General Management Plan* also set forth the goals of reclaiming much of the park's natural grandeur lost over time as a result of overdevelopment and of restoring areas of ecological and aesthetic importance. Yosemite Valley has an exceptional complex of meadows, rivers and streams, forests, and geological formations. The ecosystem supports a wide range of plant and animal communities. The proliferation of infrastructure and facilities has led to the degradation of areas critical to sustaining the natural processes and biodiversity.

The *Draft Yosemite Valley Implementation Plan* proposes eliminating or relocating numerous facilities to enable restoration. Campsites in floodplains and sensitive riparian habitat would be relocated to safer, less sensitive areas in the valley. Maintenance and other administrative facilities not required to support valley operations would be relocated out of the valley. The *Draft Valley Implementation Plan* identifies the most appropriate areas to support visitor facilities. The plan also identifies nonessential facilities that could be relocated out of the valley. These elements combine to provide a comprehensive, sensible way to maximize the restoration of natural areas while supporting visitor needs.

In preparation for development of alternatives, information was gathered, analyzed, and described in the valley resource analysis (using a geographic information system), valley circulation alternatives, functional analysis (to determine essential NPS functions that must remain in the valley), and a cultural landscape study. In order to obtain more detailed information on the socioeconomic environment and the effects of alternative actions on that environment, a detailed socioeconomic description and impact analysis was prepared. These are described in this document (see project flow chart).

Planning Issues

The most pressing planning issues are associated with the implementation of the *General Management Plan.* These issues focus on restoration of natural systems, scenic quality, removal of nonessential functions and facilities from the valley, relocation of other facilities out of sensitive or hazardous areas, and reduction of traffic congestion. The January 1997 flood has also been included as an issue.

A comprehensive list of issues raised by the public during scoping is provided in the "Consultation and Coordination" section. A list of specific aspects of the environment that could be impacted by actions in this plan is included in the "Environmental Consequences" section.

Stewardship of Resources. GMP proposals to remove development from floodplains and geologic hazard areas should be implemented



YOSEMITE NATIONAL PARK

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with minimal impact on other sensitive resources. The VIP process analyzed resource values in the valley in order to relocate development to the least sensitive areas. The *Operations Functional Analysis* determined which functions were essential in the valley in order for the National Park Service to carry out its mission. The National Park Service and the public must evaluate the costs and the benefits to resources and visitor experience of each alternative.

Scenic Quality. Yosemite is known for its extraordinary scenic quality. Any proposal for Yosemite Valley must consider impacts on views from various vantage points.

Traffic Congestion / Access to the Valley. In 1980 the park's visitation was 2.3 million. By 1994 visitation nearly doubled — 4.1 million people visited the park. Traffic volumes in Yosemite have become so high that access to Yosemite Valley had to be restricted for seven weekends between May and July in 1995. The high volumes of traffic adversely impact resources, compromise visitor safety, diminish the visitor experience, and adversely affect the efficiency and reliability of public transportation (shuttle) vehicles operating in the valley. Given the daily vehicle congestion and resource damage resulting from current visitation levels, unrestricted vehicle access to the valley cannot continue. Piecemeal attempts to reduce the number of day use parking spaces have resulted in out-of-bounds parking and impacts to resources. The *General Management Plan* calls for addressing traffic congestion through a regional transportation system. This goal remains a priority. The National Park Service is involved in a process to develop such a system under the leadership of the Yosemite Area Regional Transportation Strategy (YARTS). Each action alternative in this document proposes a solution to reduce traffic congestion in Yosemite Valley that could be integrated into a regional transportation system or independently implemented, if necessary.

January 1997 Flood. In January 1997 severe flooding occurred in Yosemite Valley. Several campgrounds were severely damaged by the scouring and deposition associated with the flooding, and some structures outside the mapped floodplain were flooded by up to 5 feet of water. The VIP planning process must resolve whether the structures and campsites that were flooded will be reconstructed in the floodplain, removed, or relocated as prescribed in the *General Management Plan* or later plans. There is limited land available in the valley that is not subject to rockfall or in the 100-year floodplain. This plan must take into consideration the influences of this flood and whether additional actions should be proposed to reduce impacts from future flooding.

Issues Beyond the Scope of the *Draft Valley Implementation Plan*

Revisions to the *General Management Plan*. Because the GMP proposals remain valid, the National Park Service has not revised the plan. Rather, the objective of the *Draft Valley Implementation Plan* is to provide more specific detail in carrying out the actions prescribed in the 1980 *General Management Plan.* This planning process does not consider new proposals such as changing visitor use patterns, closing state highway routes 41, 120, or 140 to through traffic at park entrances, or changing the maximum number of day use visitors.

Regional Transportation Planning. The *Draft Valley Implementation Plan* does not formally assess the proposals for a regional transportation system but considers actions that might be undertaken directly by the National Park Service. However, the National Park Service considers the development of a regional transportation system to be the preferred long-term approach for transporting people to the park. Consequently, the alternatives presented anticipate a regional system and are designed to complement the efforts of the YARTS group to develop such a system. The National Park Service is a participant in YARTS, working with other jurisdictions and interests to identify and evaluate regional transportation options and the means for implementing and funding them.

The transportation focus in this plan is on valley circulation and potential requirements. Through the YARTS process there will be opportunities

for linking the valley transportation system to regional transportation systems, and VIP alternatives were developed to encourage and support a regional approach. Development of regional transportation options will involve the state, counties, local communities, the National Park Service, and other parties.

Out-of-Park Staging. Alternatives for out-of-park staging and transportation are being evaluated through the YARTS process.

Day Use Reservations. In order to implement the GMP carrying capacity limit for day use vehicles in Yosemite Valley, a day use vehicle reservation system is being considered that would provide a reasonable method of controlling congestion. The alternatives described in this document would all function with such a system. However, implementation specifics are beyond the scope of this plan and will be evaluated separately.

Plans, Studies, and Analyses

The following is a description of the plans, studies, and analyses that have been completed to help meet the objectives of the *Draft Valley Implementation Plan.*

Geographic Information System (GIS). Clarifying environmental constraints, identifying areas most desirable for restoration, and considering environmental concerns in delineating circulation corridors were critical to the development of alternatives. A resource analysis for the valley floor used a geographic information system, which is a computer-based process that stores, retrieves, manipulates, analyzes, and displays geographically referenced data. This process involved the creation of 14 resource data layers that were ranked by resource value from highest to lowest. The resource values were then summed to create four resource value maps: natural, scenic, cultural, and physical. Those four maps were combined into an overall resource value map for the entire valley with areas ranked according to resource value. There was a screen-out category for areas that are to be avoided (such as wetlands, geohazard areas, and national landmarks). The higher an area was valued on each data layer, the higher was its resource value on the map. The overall resource value map, combined with the current infrastructure map, was used for guidance in planning redevelopment, relocation of development out of sensitive resource areas, and restoration of sensitive resource areas. All the maps were used to help determine the environmental consequences to resources. More detailed information on the source of each data layer is provided in appendix E.

Functional and Space Inventory *(Operations Functional Analysis, 1993).* The functional and space inventory was prepared to determine how the park could carry out its mission with the fewest possible facilities in the valley. The data in the functional analysis, along with other information, was used to determine which functions could be removed from the valley and what space would be needed for functions that would remain.

Socioeconomic Analysis. A socioeconomic analysis was prepared as part of this plan to determine how the visitor population and the local communities would be impacted by VIP alternatives and to analyze those impacts.

Cultural Landscape Study *(Yosemite Valley Cultural Landscape Report, 1994).* The *Cultural Landscape Report* (CLR) was prepared to enhance the understanding of relative resource values and of the potential consequences of future changes and improvements in the valley. The CLR documents, evaluates, and analyzes the Yosemite Valley landscape from a number of perspectives. The ultimate goal was to provide planning guidance that addresses the significance of cultural, historic, and natural resources.

RELATIONSHIP TO OTHER PLANNING AND PROJECTS

1980 *General Management Plan / Environmental Impact Statement*

The goals of the *General Management Plan* are to reclaim priceless natural beauty, markedly reduce traffic congestion, allow natural processes to prevail, reduce crowding, and promote

visitor understanding and enjoyment. The *General Management Plan* and all other park management activities are directed toward achieving the following management objectives:

Resource Management Goals:

Restore and maintain natural terrestrial, aquatic, and atmospheric ecosystems so that they may operate essentially unimpaired.

Conduct continuing research to gather and analyze information necessary for managing natural resources.

Restore altered ecosystems as nearly as possible to conditions that would have existed if natural ecological processes had not been disturbed.

Protect threatened and endangered plant and animal species and reintroduce, where practical, those species eliminated from the natural ecosystems.

Identify and perpetuate natural processes in park ecosystems.

Permit only those types and levels of use or development that do not significantly impair park natural resources, and direct development and use to environments least vulnerable to deterioration.

Limit unnatural sources of air, noise, visual, and water pollution to the greatest degree possible.

Preserve, protect, and restore scenic resources.

Identify the major scenic resources and the places from which they are viewed.

Provide for the preservation or protection of scenic resources and viewing stations.

Provide for historic views through vista clearing.

Permit only those levels and types of use that are compatible with the preservation or protection of the scenic resources and with the quality of the viewing experience.

Preserve, restore, or protect significant cultural resources (historic and prehistoric).

Identify, evaluate, and determine the significance of cultural resources, encompassing buildings, structures, sites, and objects.

Provide for the preservation, restoration, or protection of the significant cultural resources.

Permit only those uses that are compatible with the preservation of significant cultural resources.

Visitor Use Goals:

Assist all people in understanding, enjoying, and contributing to the preservation of the natural, cultural, and scenic resources.

Orient visitors, provide personal assistance, and inform them about opportunities the park provides.

Provide interpretive services that relate the natural and cultural significance of Yosemite to visitors with broad interests.

Provide only for those types and levels of programs and activities that enhance visitor understanding and enjoyment of park resources.

Permit only those levels and types of accommodations and services necessary for visitor use and enjoyment of Yosemite.

Provide the opportunity for a quality wilderness experience.

Provide transportation services that facilitate visitor circulation and enhance preservation and enjoyment of park resources.

Park Operations Goals:

Maintain a safe, functional, and orderly environment that provides compatible opportunities for resource preservation and enjoyment by visitors and employees.

Classify park lands, specifying their management and use, to ensure the achievement of all objectives.
Provide facilities for administration, maintenance, and management at appropriate locations.

Locate facilities to minimize exposure to natural hazards such as rockslides, flooding, avalanches, and hazard trees.

Encourage appropriate uses of structures with historic, architectural, or engineering significance, consistent with the preservation of their historic fabric.

Provide facilities and utility systems that conserve energy and comply with all applicable standards and codes.

Protect the rights, safety, and security of all visitors and employees.

Remove barriers that interfere with use of developed facilities by people with disabilities and other special populations and provide easy access for all visitors whenever feasible.

Adjust park boundaries as required to preserve and provide for enjoyment of nationally significant resources, complete ecological units insofar as possible, and provide for more effective management.

Provide services and amenities conducive to a community environment for employees.

Support an integrated system of compatible regional land uses with opportunities for recreation, community development, preservation, and economic use of resources.

Participate with government agencies and private interests in planning for compatible management and use of scenic, natural, cultural, and recreation resources.

Promote visitor services and accommodations at sites more appropriate to the preservation of park values and the public interest through coordinated regional planning and encouragement of private enterprise outside the park.

Actions prescribed by the *General Management Plan*:

Remove most nonessential operations (including two-thirds of the employee housing). Redirect development to the periphery of the park and beyond to preserve the essence of wilderness in the valley.

Remove intrusive or environmentally damaging facilities or relocate them to more resilient environments.

Develop a public transportation system that would allow the eventual elimination of private vehicles from the valley.

Restore and perpetuate natural processes of the park ecosystems including removal of facilities from floodplains and geologic hazard areas.

Establish a maximum number of visitors (day use 10,530; overnight 7,711) to be accommodated in the valley each day.

Prepare comprehensive design plans for specific areas including Yosemite Village, Curry Village, and Yosemite Lodge.

Other Proposals of the *General Management Plan:* Some of the proposals were tentative recommendations based on available information, and they required further study before they could be implemented. Studies completed or underway are:

- a housing study to determine housing availability outside the park and the need for housing in Yosemite Valley, El Portal, and Wawona
- a transportation study for Yosemite Valley and outlying areas to determine public transportation alternatives to automobiles
- a parkwide water study to form the basis for water resources management

Yosemite Valley Housing Plan

In 1992 the National Park Service released the *Draft Yosemite Valley Housing Plan / Supplement to the Environmental Impact Statement for the General Management Plan.* The project had two purposes: to improve housing for NPS, concession, and other employees who provide visitor services in Yosemite Valley and to imple-

ment the GMP objective to remove nonessential employee housing from the valley. It described five alternatives for providing housing for the 1,359 employees living in Yosemite Valley.

The preferred alternative in that document would have provided primary housing for 952 employees in Foresta. The majority of public comments on the housing plan opposed the proposal. In response, two new alternatives were developed that consider providing housing for 689 employees in El Portal and call for the removal of housing units from the valley. Under the new proposed action, a total of 1,014 employees would be housed in the valley, and 345 would move out of the valley. All tent cabins and substandard housing would be removed. Headquarters for both the national park and the concession would be moved to El Portal. The new alternatives are described in the *Draft Yosemite Valley Housing Plan* (housing plan). The proposed action from the housing plan will be incorporated into the *Draft Valley Implementation Plan.*

The January 1997 flood severely damaged some of the substandard housing that is proposed for removal or redesign in the housing plan. In addition, some employee housing that had been believed to be out of the 100-year floodplain was severely flooded. The housing plan will propose retaining 765 employees in Yosemite Valley, 605 in El Portal, and 344 in nearby communities. Alternatives to implement the proposed action of the housing plan for the Yosemite Lodge area, taking into account flood effects, are addressed in the *Draft Development Concept Plan / Environmental Assessment for Yosemite Lodge.*

Alternative Transportation Modes, Feasibility Study

The *Alternative Transportation Modes, Feasibility Study* was part of a larger study authorized and funded by Congress to evaluate the range of transportation options, their technical feasibility, and their ability to reduce the presence and impact of private vehicles in Denali, Yellowstone, and Yosemite National Parks.

The Yosemite portion was completed in 1994 and released to the public in 1995 (see appendix D). The study evaluated both valley and remote sites for intercepting vehicles and transferring visitors to a shuttle bus system. Because of its advantages over other options, the study recommended the Taft Toe area (Southside Drive at El Capitan Crossover) for siting a transfer facility and staging (parking) area.

The public was invited to comment on the transportation study when it was released in June 1995. Over 400 responses have been received to date outlining concerns related to the staging of vehicles in the valley. Many also believed that a parking structure was being proposed for the Taft Toe site (actually, those design considerations were undefined in the study). Many of the commentaries also asked that the National Park Service consider regional transportation alternatives, including light rail (see "Transportation Symposium"). In response, the National Park Service has placed a greater emphasis on collaboration with gateway communities and regional transportation planners through its membership on the board of the Yosemite Area Regional Transportation Strategy.

Yosemite Area Regional Transportation Strategy

Yosemite Area Regional Transportation Strategy is an undertaking by a coalition of five counties, Yosemite National Park, U.S. Forest Service, California Department of Transportation, local businesses, and environmental groups. Yosemite National Park is a founding member and partner and sits on the management board and the technical review committee. YARTS has hired a professional staff and transportation consultants to provide technical evaluations of transportation modes, systems, levels of service, costs, and relevant policy questions. The YARTS group has conducted public workshops to solicit input into the development of regional transportation goals and objectives. Workshops were held in Mariposa, Madera, Merced, Mono, and Tuolumne Counties and in Yosemite National Park. The YARTS management board voted on June 2, 1997, to "focus on developing and

implementing a bus system from the gateway communities to Yosemite National Park in the near-term and to study the feasibility of implementing a rail system in the long-term." The board also ratified a recommendation that "a phased implementation of transit would best meet the YARTS goal of lessening congestion in the region while establishing a system that could be implemented relatively quickly." Details of what a transit system might be — such as type of vehicles, frequency of service, potential locations for staging areas, and financing — have yet to be developed.

The Yosemite Area Regional Transportation Strategy proposes to provide transfer facilities outside the park. YARTS and private tour buses would furnish transit shuttle service that would bring visitors to the park from gateway communities and other points.

How Yosemite National Park actions relate to the YARTS process:

- The National Park Service will seek to ensure that park projects and policies that relate to regional transportation will complement and encourage the development of such a system.
- The National Park Service will implement a transit shuttle service in Yosemite National Park and Yosemite Valley that will be coordinated with the transit services provided through YARTS and private tour buses.
- The National Park Service will seek to institute policies that promote the development of a regional transportation system. To this end, the National Park Service intends to evaluate park policies concerning entrance fees, day use vehicle reservations, vehicle parking management, and employee transportation.
- In the event that the YARTS process leads to a determination that a regional transportation system is not feasible, the National Park Service will proceed with projects consistent with the *Draft Valley Implementation Plan* that will reduce traffic congestion yet ensure visitor accessibility.

Transportation Symposium

In 1996 the National Park Service hosted a transportation symposium to investigate the technical capability, cost, operating parameters, quality of visitor experience, and environmental consequences of various modes of transportation in the Yosemite region. The symposium was held in Fresno, California. A panel of experts in transportation system planning, design, and operation evaluated a wide range of transportation modes. The panelists represented the public and private sectors, academia, and the travel industry. The public and regional partners contributed questions, comments, and perspective.

The panel developed the following conclusions on the various modes of transportation and on an approach to transportation planning in Yosemite and the region. The results will be detailed in a report.

Modes:

- Motor coaches and transit coaches, including low floor, articulated, and dual mode buses, are suitable to meet the transportation needs (based on operational flexibility, cost, infrastructure, and construction impacts; vehicles using compressed natural gas fuel would be preferred).
- "Mountain" rail, an adaptation of heavy rail/cog rail, may be possible, but would require a separate right-of-way and would be very costly. Light rail might be suitable in limited applications as a secondary mode of transportation in Yosemite Valley, but capital costs would be high.
- Sustainability and flexibility were considered in mode selection.

Transportation Planning:

- The multifaceted transportation issues require multifaceted solutions. The YARTS coalition should be used in the planning process and for development of the institutional relationships among regional, state, and federal agencies needed for system implementation. Political support will evolve if goals are developed jointly.
- A long-term vision with phased implementation of solutions should be developed. Solutions should have short-, mid-, and long-term elements.
- A multicorridor solution for park access is needed. Different corridors may have different solutions, but all corridors should be served. Safe and convenient staging areas should be provided.
- Visitors should be intercepted as close to their point of origin as possible.
- Land use planning should be linked to transportation planning. Services should be placed near users to reduce transportation requirements.
- A meeting with leaders from the communities, state, National Park Service, tour industry, and environmental community should be convened to develop transportation implementation plans.
- Knowledge of the market (visitor) is critical. The visitor database should be expanded and updated.
- The socioeconomic implications of transportation options should be known.
- Marketing and user-friendliness of the valley shuttle should be improved.
- Yosemite can be a model for the San Joaquin Valley.

Concession Services Plan

The *Concession Services Plan / Supplemental Environmental Impact Statement*, prepared in 1992, defined the management of concession services in Yosemite to meet the goals of the *General Management Plan.* The plan called for a greater reduction in the total number of overnight accommodations and examined the types of available lodging. The variety and location of food service facilities were redefined to better meet the needs of park visitors. The total amount of retail space was reduced and a process established to tie merchandise more closely to park themes. The plan provided for the continued use of the Village Store, the valley warehouse, and the ice rink at Curry Village.

The plan was specifically incorporated into a new concession contract that went into effect October 1, 1993. One of the special features of the new contract was the setting aside of nearly 5% of the concessioner's gross receipts in a capital improvement fund. Under NPS direction, the fund would be used to accomplish major rehabilitation and capital improvements to structures and to implement concession-related components of the *General Management Plan.*

Flood Recovery Planning

In response to the January 1997 flood, the scope of this plan was revised to allow more rapid response to issues of a day use reservation system and rehabilitation of the Yosemite Lodge area.

The possibility of implementing a day use reservation system when the park opened on a limited basis was considered. In the lodge area, which was the most seriously impacted in the valley, about half of the overnight lodging units and all of the concessioner housing units were damaged. Environmental assessments are in progress for a day use reservation system and recovery of the lodge area. Therefore, while the *Valley Implementation Plan* assumes that a day use reservation system will be in place and that the Yosemite Lodge area will continue to be a lodging and employee housing area, specific information on the reservation system and Yosemite Lodge alternatives will not be included in this document. The reservation system and the lodge will be discussed only in general terms. Specific information concerning the two elements will be available in separate environmental assessments.



ALTERNATIVES, INCLUDING THE PROPOSED ACTION

ACTIONS COMMON TO ALL ALTERNATIVES

The intent of the *Draft Valley Implementation Plan* is to move forward the primary goals of the 1980 *General Management Plan*, which are to reclaim priceless beauty, reduce vehicle numbers and traffic congestion, allow natural systems to prevail, reduce crowding, and promote individual understanding and enjoyment.

Four alternatives are analyzed in this document for removing nonessential structures, restoring and protecting habitat areas, relocating facilities out of sensitive or hazardous areas, and reducing vehicle numbers and traffic congestion in Yosemite Valley. The alternatives include actions prescribed in the *General Management Plan* and other related plan amendments, such as the 1992 *Concession Services Plan* and the 1996 *Draft Yosemite Valley Housing Plan.*

The alternatives present different planning and management approaches for achieving the prescribed actions; however, some actions are so similar that they are proposed in all alternatives. The following actions common to all alternatives are related to natural resource management, cultural resource management, interpretation and visitor services, visitor use and development, and operations.

SPECIFIC VALLEY MANAGEMENT PLANS

The 1980 *General Management Plan* provided the framework for developing and implementing other more detailed plans and studies for management of the park and Yosemite Valley. These plans, in conjunction with the proposed improvements to facilities, functions, natural and cultural resources outlined in the alternatives section, provide specific details for the proper preservation, interpretation, and management of Yosemite Valley. Current management plans for Yosemite Valley include the *Resources Management Plan*, the 1990 *Fire Management Plan*, the 1989 *Wilderness Management Plan*, the 1987 *Peregrine Falcon Management Plan*, and the 1986 *Bear Management Plan.* These plans would continue to be implemented.

NATURAL RESOURCE MANAGEMENT

In all of the action alternatives facilities would be removed from riparian areas, floodplains, and meadows. The alternatives vary in degree. Mitigation and compliance for natural resources would be conducted before any actions were taken that could affect natural resources as required by the National Environmental Policy Act and NPS *Management Policies*. Ecological restoration for each area would be based on historical documentation of environmental conditions, knowledge gained from previous restoration efforts, best management practices, restoration ecology, and field investigations. All restoration work would be monitored and documented.

The tennis courts at the Ahwahnee Hotel would be removed and the area restored to natural conditions. Bear/human contacts would be reduced through the use of bear-proof facilities and equipment and by education programs.

CULTURAL RESOURCE MANAGEMENT

Cultural resources would be managed under the National Historic Preservation Act., the American Indian Religious Freedom Act and other statutes, NPS 28, *Cultural Resource Guidelines,* and NPS *Management Policies* (1988) and related guidelines. Section 106 compliance has been completed for actions prescribed in the *General Management Plan* and the *Concession Services Plan.* The National Park Service is working with the state historic preservation office and the Advisory Council on Historic Preservation to prepare a programmatic agreement to ensure proper treatment of cultural resources and incorporate necessary compliance.

Cultural resource professionals and specialists would be involved in the development of both conceptual and preliminary design. This participation would occur at the earliest planning sessions and continue throughout the development of design and construction documents. Every effort would be made to avoid adverse effects through design. Should this prove impossible, mitigation strategies would be developed in consultation with the state historic preservation office and affiliated American Indian groups and would include documentation commensurate with significance.

Historic Structures and Cultural Landscapes

The National Park Service would advise concessioners of actions proposed by this plan that would affect cultural resources under their control.

Treatment would be in accordance with the *Secretary of the Interior's Guidelines for the Preservation of Historic Structures* and other guidelines. All plans and specifications for preservation, restoration, stabilization, and adaptive use would be prepared by an historical architect.

Demolition would be planned in cooperation with a historical architect. The park curator and historical architect would be notified when demolition plans begin and all demolition plans would include plans for architectural salvage at the discretion of the curator and historical architect.

Six structures that contribute to the Yosemite Village historic district would be preserved, rehabilitated, and adaptively used: the girl's club as a library (current use), the two girl's dormitories as offices and meeting rooms (current use), residence 70 as a day care center (current use), the Pohono Indian Studio as a wilderness center (current use), and the NPS administration building and old museum as new museums.

One building of significance to American Indian history, a dwelling from the last American Indian village site (building 120), would be returned to its original location west of Sunnyside Campground where the new cultural center would be built. The superintendent's house, garage, and utility building would be removed as described in the *General Management Plan.*

Archeology and Historic Sites

All development plans would be reviewed by the park archeologist for potential impacts. The National Park Service would conduct intensive documentary research and subsurface surveys to identify any resources in sensitive areas. Should significant buried deposits be located or should impacts on previously identified sites be unavoidable, data recovery excavations would be undertaken. These subsurface survey and data recovery efforts would be guided by the 1981 *Parkwide Archeological Research Design* and the 1996 *Draft Archeological Synthesis and Revised Research* design. Representatives of culturally affiliated Indian groups, the American Indian Council of Mariposa County, Inc., and the Mono Lake Indian community would be involved in these efforts.

Ethnographic Sites and Resources

Consultation with designated American Indian groups would be initiated regarding all proposals involving impacts on traditional resources or sites. The National Park Service would work with the designated groups to develop mitigative strategies should avoidance of ethnographic resources prove impossible. All sites and resources would be monitored during development activities to ensure compliance with NPS and legal requirements.

Collections

A collections condition survey, collections storage plan, and an emergency operations plan would be prepared prior to development to provide guidance for designers of any new collections facility. Design review of plans and

specifications at both the conceptual and final levels would be provided by the park's curator and librarian.

Movement of museum collections and design of facilities would be accomplished in accordance with Special Directive 80-1, NPS Preservation and Protection Standards for Museum Collections (1986).

INTERPRETATION AND VISITOR SERVICES

The Yosemite museum would expand to fill most of the building at its current location, becoming the human history museum. A new natural history museum would be established in the renovated administration building where exhibits would focus on natural history. These subjects would be presented at specific and detailed levels to meet educational as well as general visitor needs. Both would house permanent and temporary exhibits and craft and book sales.

The Indian Village of Ahwahnee, behind the Yosemite Museum, would remain in its present configuration and would continue to display reconstructed American Indian habitations and ceremonial structures, and exhibits there would provide additional information about artifacts and life practices. From time to time, American Indian cultural demonstrators would be on hand to present demonstrations of activities associated with traditional lifeways.

The cemetery would continue to be accessible to visitors, and the self-guiding trail would remain. Path locations would be revised to avoid trampling graves and to assist natural revegetation of the site. The Yosemite Village mall would be redesigned to provide improved interpretive and shuttle stop space. The wilderness center would continue to issue wilderness permits and provide interpretation and products for safe and resource sensitive wilderness travel. The nature center at Happy Isles would remain as a center for natural history interpretation and junior ranger programs.

An Indian cultural center would be built by American Indians west of Sunnyside Campground as prescribed in the *General Management Plan* for ceremonial use.

Concession-operated interpretive and hands-on activities, such as those offered at the art activity center and along the mall, would be encouraged, and shopping opportunities would remain.

In Curry Village the amphitheater would provide interpretive programs on summer evenings.

Two other amphitheaters, located in campgrounds, would also provide space for interpretive programs in the summer for campers.

A parkwide interpretive plan will be prepared following the approval of the *Valley Implementation Plan.* Detailed interpretive development plans will be prepared to guide interpretation and visitor services design for every developed area as redevelopment begins. Interpreters would be included in all development planning at both the preliminary and design development work stages.

Bus touring, shopping, strolling/walking/sitting, camping, picnicking, dining, bicycle touring, fishing, hang gliding, hiking, horseback riding, ice skating, photography, rock climbing, cross-country skiing, swimming, and wilderness use would continue unless resource issues necessitate change. Horse rentals and guided equestrian tours would be discontinued in the valley and would be available only in Wawona and Tuolumne Meadows.

VISITOR USE AND DEVELOPMENT

In order to manage private vehicles in the valley, reduce congestion in the primary visitor destination areas, and allow for restoration of the Merced River corridor and other natural areas, day use vehicles could eventually be managed by a reservation system. Some alternatives provide additional methods. Overnight visitors using valley lodging and campground facilities would continue to drive to their accommoda-

tions in the east end of the valley. The valley shuttle system would continue to provide free shuttle service to all east valley destinations.

Yosemite Lodge

Yosemite Lodge would be retained as a visitor destination area. Common facilities, lodging and employee housing, parking and circulation patterns, Sunnyside Campground, and access to both upper and lower Yosemite Falls trailheads would continue as documented in the *Draft Yosemite Lodge Development Concept Plan / Environmental Assessment* (April 1997). The concepts provided in that design document are incorporated into all VIP alternatives as existing conditions.

Visitor Transportation / Orientation

Both day use visitors and overnight guests would continue to use private vehicles, tour buses, and out-of-park transit vehicles as the primary modes of transportation to Yosemite Valley. Regional transportation systems developed outside the park would be accommodated under all alternatives. Upon reaching valley destinations, visitors would use the circulator shuttle bus system or bicycles or could walk around the valley.

Initially, visitors with special needs (such as those with disabilities or American Indians involved in traditional and ceremonial practices) would continue to use private vehicles marked for special access when shuttle bus use would be inconvenient or inappropriate. Eventually shuttle buses outfitted for people with disabilities would be available for tours in the valley and other park areas.

Guest Lodging

Guest lodging to be provided at valley developed areas would change from 1,525 to 1,215 accommodations as prescribed in the 1992 *Concession Services Plan*. This represents an overall reduction of 20.4 % in accommodations valleywide. These reductions would occur generally from the removal of lodging units from floodplain and geohazard areas. Under the *Concession Services Plan* there would continue to be a mix of deluxe, midscale, economy, and rustic accommodations. The continued existence of economy accommodations would benefit relationships among the park, concessioner, and educational institutions (such as Yosemite Institute) during nonpeak seasons. Table 1 presents a summary of lodging accommodations for each of the valley developed areas (except Yosemite Lodge, 440 units).

TABLE 1: LODGING SUMMARY

Number of Units	Lodging Type
Ahwahnee	
99	Hotel rooms with bath / 1 building (Ahwahnee Hotel)
24	Cottage rooms / 9 buildings (Ahwahnee Hotel cottages)
123	**Total**
Housekeeping Camp	
232	Camping shelters (remove 68, restore habitat, retain 232)
Curry Village	
18	Lodge rooms with bath / Stoneman Lodge (or equivalent as cabins)
103	Cabins with bath; singles, doubles, and quads / 48 buildings (renovate)
149	Cabins without bath; singles and doubles (remove all 80 cabins, replace with 149 cabins with baths)
150	Tent cabins (remove 276, restore habitat, retain 150)
420	**Total Rooms**

Food and Retail Services

At Yosemite Village, the post office, Ansel Adams Gallery, and medical clinic would remain.

The Ahwahnee Hotel main dining room, bar, gift shop, and other visitor services would remain in their current locations and would continue to provide service to hotel guests.

The Curry swimming pool would remain, and the mountaineering shop would have equipment, training, and guides available for those who want to visit the park's remote areas. Bicycle rentals would be available. The Curry pavilion would be redesigned to provide 270 outdoor and 370 indoor seats. The bar would be relocated away from the seating and amphitheater. Happy Isles snack bar would be retained.

SUSTAINABLE DEVELOPMENT

The concept of sustainable development and management, as defined in the NPS *Guiding Principles of Sustainable Design* (1993), attempts to minimize human impacts, recognizing that development can often deplete natural support systems, change ecosystem functions and interrelationships, or lead to the destruction of significant cultural resources. Central to the concept of sustainable development is the idea that all decisions — from initial concept, through design, construction, and operations — must be evaluated in light of principles of conservation.

The principles to be used in the design and management of park and other visitor facilities emphasize environmental sensitivity in planning, design, construction, operation, and maintenance; the use of nontoxic materials, resource conservation, recycling; and the integration of visitors into natural and cultural settings.

Principles to support sustainable development have been provided for the following topics: community fabric, interpretation and visitor management, site design, building design, and energy management. These topics are briefly described below as they apply to the implementation of the *General Management Plan* for Yosemite Valley.

Community Fabric

Sustainable park development includes the provision of adequate facilities, institutions, and services to support a healthy community for park employees and their families. These provisions must address a variety of material, health, educational, and social needs. Park employees must have free time away from visitors for relaxation and recreation. Needed services, supplies, and facilities include groceries and household supplies; exercise, recreation, and health care; infant and child care; primary, secondary, and adult education; a library; and facilities for group celebrations, gatherings, and religious services.

Interpretation and Visitor Management

Sustainable park development, to be truly successful, should anticipate and manage visitor experiences. Interpretation provides the best single tool for shaping experiences and sharing values. By providing an awareness of the environment, values are taught that are necessary for the protection of the environment. Sustainable design should seek to affect not only immediate behaviors but also long-term beliefs and attitudes of visitors. To achieve a sustainable park or resource-related operation for Yosemite:

> Visitor experiences should be based on intimate and sensory involvement with natural and cultural resources. The local American Indian culture should be included. The experiences should be environmentally and culturally compatible and, through understanding and appreciation, should encourage the protection of those resources.

Site and facility design should contribute to the understanding and interpretation of the local natural and cultural environments.

Interpretation should make the values of sustainability apparent in all aspects of operation, including services, retail operations, maintenance, utilities, and waste handling. A good example should be set in all facets of operation.

Site Design

Site design involves the integration of circulation, structures, and utilities in natural and cultural environments. The process encompasses many steps from planning to construction, including initial inventory, assessment, alternative analysis, detailed design, and construction procedures and services.

Sustainable site design reinforces the holistic character of a landscape. It conveys appreciation of, and respect for, the interrelationships of all parts of the natural systems and cultural context of the site. The process of sustainable site design includes:

planning landscape development according to the surrounding physical context

maintaining both ecological integrity and economic viability in a sustainable development

understanding the site as an integrated ecosystem with changes occurring over time in dynamic balance; the impacts of development must be confined within these natural changes

allowing the natural ecosystem to be self-maintaining to the greatest extent possible

allowing simplicity of functions to prevail while respecting basic human needs of comfort and safety

minimizing areas of vegetation disturbance, earth grading, and water channel alteration

locating structures to take maximum advantage of passive energy to provide for human comfort

determining environmentally acceptable means of onsite energy production and storage in the early stages of site planning

phasing development to allow for the monitoring of cumulative environmental impacts of development

developing facilities to integrate selected operational functions such as energy conservation, waste reduction, recycling, and resource conservation into the visitor experience

Building Design

Sustainable building design balances human needs (rather than human wants) with the carrying capacity of the natural and cultural environments. It minimizes environmental impacts, importation of goods and energy, and generation of waste. The long-term objective of sustainable design is to minimize resource degradation and consumption on a global scale. Sustainable building designs should:

be subordinate to the ecosystem and cultural context.

reinforce and exemplify environmental responsiveness

use the simplest technology appropriate to the functional need and incorporate passive energy-conserving strategies responsive to the local climate

use renewable indigenous building materials to the greatest extent possible avoid use of energy-intensive, environmentally damaging, waste producing, or hazardous materials

strive for smaller is better, optimizing use and flexibility of spaces so overall building size and the resources necessary for construction and operation are minimized

consider constructability, striving for minimal environmental disruption, resource consumption, and material waste, and identifying opportunities for reuse/recycling of construction debris when selecting construction materials

provide equal access to the full spectrum of people with physical and sensory impairments while minimizing impacts on natural and cultural resources

allow for expansion or adaptive uses with a minimum of demolition and waste; materials or components should be chosen that can be easily reused or recycled

Energy Management

At the beginning of the planning process a determination must be made to avoid energy-intensive or unnecessary operations. Considerable energy can be conserved if access to, from, and in a development is planned around alternative transportation systems, bicycle routes, and pedestrian walkways and trails rather than personal automobiles.

Facility design can contribute to energy conservation in several ways. Through recycling facilities, building only the minimum to satisfy the functional requirements, and requiring facilities to serve multiple functions, new building materials and the energy of transporting and constructing them are minimized. In addition, considerable electrical and thermal energy can be saved through facility design that incorporates natural lighting and the other energy-conserving strategies.

In visitor lodging, efficient methods, devices, and appliances should be employed to conserve energy. Almost all facets of development and visitor services can profit from recent innovations in energy efficiency.

Resource-related development should emphasize pedestrians and reduce dependency on fossil fuels. Walkways and hiking trails can encourage walking. Bicycle rentals and the use and coordination of efficient public shuttle bus transportation in developed areas can all serve to reinforce less consumptive lifestyles.

ACCESS FOR VISITORS WITH DISABILITIES

As stated in NPS *Management Policies*, the National Park Service would provide the highest feasible level of physical access for persons with disabilities to all buildings and public use areas consistent with the preservation of historic structures, sites, and properties. For historic structures, access modifications would be designed and installed to least affect the features of a property that contribute to its significance. Some impairment of features would be accepted when providing access.

Access to historic sites for visitors with disabilities could be made available by special tour services. Specialized equipment could be used to make building access easier, and trained interpreters could tailor programs to meet individual needs. All nonhistoric buildings in the valley would be made accessible to persons with disabilities, and visitor services would be adapted for visitors with special needs. Where accessibility would be restricted due to resource protection constraints, natural barriers, or terrain, programmatic accessibility would be provided.

ACCESS FOR AMERICAN INDIANS FOR TRADITIONAL AND CEREMONIAL USE

In keeping with the American Indian Religious Freedom Act, Executive Order No. 13007 (Accommodation of Sacred Sites), and NPS policies on American Indian relationships and ethnographic properties, the National Park

Service would continue to provide access to culturally affiliated American Indian individuals and groups for traditional and ceremonial purposes. The National Park Service would continue to establish and formalize relationships with Indian tribes and communities affiliated with the land and resources in Yosemite Valley.

The National Park Service would continue to work with the American Indian Council of Mariposa County, Inc., to establish an Indian cultural center, formalize arrangements for annual traditional cultural activities, and formalize a plan for the collection of traditional plants in Yosemite Valley.

PARK OPERATIONS

Employee Housing Summary

In accordance with the housing plan, NPS and concessioner employee housing would be provided only for employees providing direct visitor services, resource protection, or round-the-clock facility surveillance and maintenance or who otherwise require occupancy near a job site in the valley. Concessioner seasonal housing removed from hazardous or sensitive resource areas would be replaced in the Yosemite Lodge area. Employee and community support facilities would be located in the Yosemite Village residential area. All other noncritical NPS and concessioner employee housing in the Yosemite Village area would be moved out of the valley.

Employee tent cabins and related structures in Camp Six would be removed from the 100-year floodplain, which would permit restoration of the riverbanks and riparian areas along the Merced River. Ahwahnee Row housing at Lower Tecoya would be removed and the area restored to black oak woodland/meadow ecotone. Visual impacts would also be mitigated along Ahwahnee Meadow by removal of the employee housing at Ahwahnee Row. The Huff House (concession housing) and related parking at Curry Village would be removed as prescribed in the *General Management Plan* and the housing plan. The area would be restored. Table 2 presents a summary of NPS and concessioner housing as will be proposed in the final housing plan.

Administration and Maintenance

Park and concessioner headquarters functions would be removed from Yosemite Valley. The concessioner headquarters building would be removed and the NPS building adaptively used as a natural history museum. Most maintenance functions would be relocated to El Portal or other locations except for those that specifically serve Yosemite Valley facilities and operations. The valley maintenance building, equipment yard, and related storage structures would be removed from the valley and the area would be redesigned to accommodate NPS and concessioner maintenance, protection functions, and concessioner replacement housing. The valley electrical substation would not be changed. The concessioner's valley garage would be moved out of the valley. Light maintenance of the valley circulator and connector shuttles and day tour buses and trams would move from the village to the NPS maintenance area. Heavy maintenance of all vehicles would take place in a new facility in El Portal. The concessioner's fire battalion would remain distinct but would be relocated to the redesigned maintenance area and housed with the NPS fire battalion.

The warehouse building in the valley would be used by the concessioner for operations support, including distribution, maintenance shops, security office, recycling, employee uniforms, payroll, housing office, and computer support. An employee child care facility would be provided in the Yosemite Village area, possibly adaptively reusing a structure. The valley medical clinic, school, jail, and magistrate's office would remain.

TABLE 2: LOCATIONS FOR ALL PROPOSED HOUSING BY EMPLOYER

Where valley housing would be retained and replacement housing would be relocated (Number of beds in each location)[1]					
	Primary Concessioner	NPS	Others	Existing Beds	Change from Current
YOSEMITE VALLEY					
Ahwahnee row houses and apartments				64	-64
Lower Tecoya dorms and apartments	234			234	0
Middle Tecoya (including clinic)	14	9	17	40	0
Upper Tecoya		11	11	22	0
Lost Arrow dorm	36			36	0
Yosemite Village	9		7	16	
Ahwahnee dorm				45	-45
Camp Six				148	-148
Yosemite Lodge				16	-16
Yosemite Lodge dorms				136	-136
Yosemite Lodge Annex cabins				55	-55
Yosemite Lodge "Ozone"				90	-90
Stables	4			40	-36
Curry Village (includes Cook's WOBs)	5			36	-31
Curry Village — Terrace				150	-150
Curry Village — Boys Town				170	-170
NPS housing, historic district		62	10	72	0
New sites[2]	336				336
Valley Totals	**638**	**82**	**45**	**1370**	**-605**
Total Beds					**765**
NONVALLEY SITES					
El Portal	603		2		+605
Wawona					0
Foresta					0
Nonvalley Totals (Replacement Housing)	**603**	**0**	**2**		**+605**

Where Additional Housing Would Be Located					
Yosemite Valley					0
El Portal		136	208		+344
Wawona					0
Foresta					0
Totals (Additional Housing)	**0**	**136**	**208**		**+344**

Source: *Draft Yosemite Valley Housing Plan*

1. Numbers indicate beds dedicated to an employee, not total beds in a unit. For example, a four-bedroom house dedicated to one employee is considered to provide one bed.

2. New sites are identified as Yosemite Lodge (redesigned, 336 beds).

Recommended Staffing

NPS staffing levels for the valley were determined in consultation with park staff during preparation of the 1993 operations functional analysis. The functional analysis was prepared to determine which functions could be removed from the valley and what space would be needed for functions that would remain. The analysis also evaluated the general staffing requirements that would be needed in the valley to support the essential functions as part of the implementation of the *General Management Plan.*

The NPS staffing levels, as recommended by the functional analysis, include permanent and seasonal (temporary) positions that form the planning base for current NPS staff in Yosemite Valley. In addition, future staff levels are indicated that reflect the potential range of growth if adequate funding is received. Table 3 presents a summary for NPS staff in Yosemite Valley. The numbers are based on assumptions that might change over time, which could affect service and staffing levels. These numbers are used for planning purposes and for projecting facility needs.

TABLE 3: PLANNING BASE FOR NPS STAFF

Division	Current[1]	Future[2]
Valley interpretation[3]	28 (9/19)[4]	59 (19/40)
Maintenance	90 (62/28)	110 (69/41)
Protection[5]	94 (49/45)	126 (67/59)
Natural resources	3	3
TOTAL	**215 (128/92)**	**298 (158/140)**

Source: *Operations Functional Analysis* 1993.

1. Current level of service with nonessential functions removed from the valley
2. Adequate level of service with nonessential functions removed from the valley
3. Includes natural history museum, cultural history museum, valley visitor center/field, nature center at Happy Isles, and education program
4. Totals include (permanent staff / seasonal staff) estimates.
5. Includes jail operation.

ALTERNATIVE 1 — NO ACTION

OVERVIEW

Under the no-action alternative, actions recommended in the 1980 *General Management Plan*, the 1992 *Concession Services Plan*, and the 1996 *Draft Yosemite Valley Housing Plan* would continue to be implemented on a project-by-project, piecemeal basis without a consolidated and comprehensive plan and implementation program. These individual actions would be implemented as funding programs permitted. Interpretive and educational programs, visitor services, and new facilities would be provided as prescribed in these approved plans, but without further coordination. Campground facilities damaged or destroyed in the January 1997 flood incident would be replaced in numbers and locations as prescribed in previous plans (see Alternative 1 maps).

NATURAL RESOURCE MANAGEMENT

Natural resources would be managed as they are presently. Current plans that cover natural resources include the *Resources Management Plan, Wilderness Management Plan, Fire Management Plan, Bear Management Plan,* and the *Peregrine Falcon Management Plan.* These plans would continue to be implemented.

CULTURAL RESOURCE MANAGEMENT

The management of the valley's cultural resources would not change under this alternative. All buildings and structures and archeological and ethnographic resources owned by the National Park Service, including those assigned to Yosemite Concession Services, in the developed areas of the park would eventually be managed as described in the *General Management Plan, Concession Services Plan*, and the *Draft Yosemite Valley Housing Plan.* All would be treated in conformance with laws, regulations, and guidelines, including the National Historic Preservation Act, the *Secretary of Interior's Standards for Rehabilitation of Historic Buildings* and the *Secretary's Guidelines for Archeology and Historic Preservation*, and the policies of NPS-28 *Cultural Resource Management Guideline* (NPS 1994).

Cultural landscape resources have been identified, but national register evaluations have not been completed. These resources would continue to be used as they are today, with repair and maintenance done in response to deterioration and utilitarian requirements.

Park collections and records would continue to be housed and protected as they are today. Preservation and management guidance would continue to be provided by NPS-28 and Special Directive 80-1, NPS Preservation and Protection Standards for Museum Collections (NPS 1986). Conservation activities would continue to be restricted to emergency work done by contract.

Research for all cultural resources would continue as funds and personnel allow. Most time and money would be consumed by sporadic activities relating to specific projects. Occasional progress would be made in nominating and listing some resources on the national register.

INTERPRETATION AND VISITOR SERVICES

Visitor use and enjoyment of the valley would continue as at present. The visitor experience would continue to fluctuate in quality and degree in relationship to crowding. There would continue to be active, passive, and social recreation and interpretation and education. Some of these activities are dependent on the valley's resources; others are neither related to nor dependent on the resources.

Access would continue to be by automobile, tour bus, out-of-park transit vehicle, and bicycle. Pedestrian, bicycle, and stock use of paths and

trails would continue as at present. Access for people with disabilities would remain available in most buildings and facilities and would be improved and expanded over time.

Wayside signs would provide identification of features and interpretation along the valley road system for self-guided tours. Shuttle buses would have interpretive displays as well as information. The valley floor tour would continue to be available. Wayside signs would continue to guide and provide interpretation for pedestrians, and the interpretive signs at shuttle bus stops would be retained. The self-guiding interpretive walking trail would continue to serve visitors from the visitor center.

Interpretive programming would be increased in order to improve visitor understanding and enjoyment of the park features and themes.

Information / Orientation

Information service would be decentralized, with emphasis on increased service at park entrances and in campgrounds and lodging facilities.

Information, visit planning, and wayfinding assistance would continue to be provided by park staff at the visitor center, lodging registration, and campground kiosks. Bulletin boards in the visitor center and near campgrounds would provide event and safety information, as would the informal services and announcement boards provided by the concessioner at lodging facilities. Roving interpreters would be on duty for information and directions, as well as for casual interpretation and safety counseling.

The Yosemite Association book stores in the visitor center lobby and at the nature center at Happy Isles would continue to offer materials with information and interpretive value.

Interpretation / Education

In Yosemite Village the visitor center would be redesigned to house the valley's central interpretive programs. Exhibits there would emphasize interpretive themes identified for the valley: scenery, biotic systems, geology, life forms, climate, wilderness/conservation, man and Yosemite, and park activities. The facility would also provide an overview of the entire park, and an auditorium would present an orientation film throughout the day. Exhibitions of Yosemite-related art would continue to be held in the visitor center or in the cultural museum.

Museum and library collections would continue to be housed in the Yosemite museum building, as well as in separate locations both in the valley and in El Portal. Conservation and protection would be provided at current levels.

Recreation

Recreation activities that would continue at their present level and in their present character are:

passive recreation: auto touring, bus touring, walking

social recreation: camping, picnicking

active recreation: bicycle touring, fishing, hang gliding, hiking, horseback riding, photography, rock climbing, cross-country skiing, swimming and wilderness use

Opportunities for picnicking would be increased. Recreational and resort developments for activities that are unrelated to the valley resources would be removed over time.

VALLEY GENERAL

Developed areas and facilities in Yosemite Valley, including lodging, retail and food services, interpretive facilities, limited maintenance support facilities, and employee

housing would be retained as prescribed under previous plans. NPS and concessioner administrative facilities, major maintenance functions, and noncritical employee housing would eventually be removed from the valley.

Vehicle circulation in the valley would continue with use of the Northside and Southside Drive one-way loop and all valley roads and bridges. Both day users and overnight guests would continue to access the valley in their own vehicles, by tour bus, or by out-of-park transit vehicles (see Alternative 1 circulation maps).

Parking for 1,271 day use vehicles would be retained in the valley, primarily at the Curry Village orchard parking area, Village Store parking lot, Camp Six, and along the circulation route in the east end of the valley. Parking for 1,487 overnight guest vehicles would remain at lodging and campground areas (excluding 440 overnight spaces at Yosemite Lodge). The *General Management Plan* and the *Concession Services Plan* made no provision for bus parking in Yosemite Valley.

YOSEMITE VILLAGE

Implementation Concept

Visitors would arrive at the village by automobile, shuttle, bicycle, or on foot from a number of locations in the valley and might not encounter the visitor center early in their visits. Their arrival in the village could be incidental to other travels in the valley. There would be no formal visitor orientation or transfer, but these activities would continue in the various valley developed areas such as Yosemite Village, Yosemite Lodge, Ahwahnee Hotel, Curry Village, and valley campgrounds.

Yosemite Village would be retained as the park's primary visitor information, orientation, and interpretation location. As prescribed in the *General Management Plan,* most NPS and primary concessioner administrative and maintenance functions would eventually be relocated outside of the park.

Food and Retail Services

The Village Store would continue to sell gifts, clothing, and groceries. The Village Grill and the Degnan's building, which houses a deli, restaurant, grill, and retail gift sales, would be unchanged. The Valley Gas Station, currently located in the Yosemite Lodge area, would be relocated to Yosemite Village near the Valley Garage. Propane service for campers would be provided at the gas station.

Circulation and Parking

All roads currently accessible would continue to be accessible, permitting visitors to circulate between village services and other valley destinations. The village would continue to be accessed by the two-way road from Sentinel Bridge and Yosemite Lodge and by one-way traffic via Stoneman Bridge from Curry Village. Circulation for residents in the Yosemite Village residential areas would be unchanged.

The valley shuttle system would continue to stop at the Village Store, Degnan's, and the visitor center and Yosemite museum.

Parking for 704 day use visitor vehicles would continue to be provided at Camp Six, the Village Store, and behind Degnan's and the post office.

AHWAHNEE HOTEL

Implementation Concept

The Ahwahnee Hotel would be retained as a visitor lodging and destination area. Visitors would arrive by car, shuttle, bicycle, or on foot and would encounter the same services and development that would be found today. Facility and lodging locations, conditions, parking, and circulation patterns would remain unchanged.

Circulation and Parking

Northside Drive would be retained as a one-way circulation route from River Campgrounds and Curry Village. The current alignment through Ahwahnee Meadow would not be changed.

The shuttle bus stop for the Ahwahnee Hotel would be retained. All Merced River vehicle and pedestrian bridges in the east end of the valley would be retained, including the Housekeeping Camp and Tenaya Creek pedestrian bridges and the Stoneman, Ahwahnee, Sugarpine, Clarks, and Happy Isles vehicle bridges.

Parking for overnight guests and staff (140 spaces) would continue to be provided.

VALLEY CAMPGROUNDS

Implementation Concept

The valley campgrounds and nature center at Happy Isles would be retained as visitor destination areas. Visitors to the campground complex would arrive as they do today and would have six campgrounds and a group camp from which to choose. Except at Sunnyside and Group Campgrounds, campgrounds would continue to be managed to allow most visitors to use any site, whether they choose to drive an RV or a car to the site or walk in. Visitors of all types would be mixed. Campground visitors would find campgrounds distributed throughout the east end of the valley. Campsites at Lower Pines, Upper Pines, North Pines, and Tenaya Creek would remain as prescribed in the *General Management Plan*, as would the concessioner Housekeeping Camp.

Campsites and Facilities

Campgrounds, 232 units at Housekeeping Camp (lodging), and the nature center at Happy Isles would be as described in the *General Management Plan.* Table 4 presents the summary of campground units under alternative 1. Campground registration functions would be retained in each campground.

TABLE 4: ALTERNATIVE 1 CAMPGROUND SUMMARY

Number of Sites	Location
116	Lower River
109	Upper River
162	Lower Pines
221	Upper Pines
76	North Pines
20/14	Walk-in / Group
38	Sunnyside walk-in (covered in Lodge DCP)
756	**Total Campsites**

Food and Retail Services

The Happy Isles snack stand would be rebuilt near the restrooms and away from the rockfall zone.

Circulation and Parking

All shuttle bus stops for the campgrounds would be retained. The Happy Isles shuttle bus loop road would be retained as a one-way circulator for shuttle bus service to the nature center at Happy Isles and trailhead to Nevada Falls from west valley developed areas.

CURRY VILLAGE

Implementation Concept

Curry Village would be retained as visitor destination and lodging area. Most visitors would arrive by way of Southside Drive, move through the village complex, and exit by the road through Stoneman Meadow, and then across Stoneman Bridge along Northside Drive. The visitor to Curry Village complex would find day

use parking, lodging, food and retail services, and equipment rentals. Day users could park at Curry Village and take the shuttle to other valley destinations. Facility and lodging locations, parking, and circulation patterns would remain generally the same. There would be substantial reductions in tent cabin lodging, and all seasonal employee housing tent cabin areas would be removed as prescribed in the *General Management Plan*, concessions plan, and housing plan. Camp ambience and layout would be retained where appropriate.

Lodging and Facilities

The registration building functions and location adjacent to Stoneman Lodge would be retained. Curry Village ice rink would not be changed.

Food and Retail Services

The Curry pavilion convenience store, mountaineering school and sports shops, and bicycle and ski rental would remain in their current locations and configurations.

Circulation and Parking

The four-way stop where Southside Drive intersects with Northside Drive and the Curry Village access road would remain unchanged. The Curry access road through the orchard parking area to Southside Drive at Stoneman Meadow would also be retained in its current location. The one-way entry loop road for lodging registration and registration parking and the drive through the cabins parking area and Huff House parking would also be retained.

Parking for 437 day use vehicles at Curry orchard would be reduced by 200 spaces. There would continue to be 33 spaces for registration parking at the interior of the registration loop road. Parking for 195 overnight tent cabin guests would be retained south of Curry orchard, and 150 overnight parking spaces would be retained for the guest cabins at the west end of Curry Village. There would continue to be 48 parking spaces at the ice rink and 120 overnight spaces for wilderness permit holders at the former Curry dump site.

Shuttle bus stops would be retained for the registration loop and at the Curry orchard day use parking area. The bicycle trail route along Southside Drive from Stoneman Bridge to the campgrounds would not be changed.

PARK OPERATIONS

The park and concessioner headquarters functions would remain in Yosemite Valley until they could be eventually relocated. Along with maintenance and other support services, minimal valley administration and concessioner office functions would be accommodated in existing buildings. NPS vehicle fueling facilities would remain in the NPS maintenance area and concessioner vehicle fueling would remain in Yosemite Village.

The Pacific Bell Telephone building and NPS stables and corral would remain in their current locations.

The concession stables would be relocated to the former Curry dump.

Staffing levels for this alternative would be as described under "Actions Common to All Alternatives." The park's volunteer program would continue to supplement park staff, particularly in interpretive and educational activities. The program would be enhanced where possible.

DEVELOPMENT COSTS

The one-time development costs for alternative 1 would be $66,321,000 (see appendix A for a breakdown of costs for this alternative).

ALTERNATIVE 2 — PROPOSED ACTION

OVERVIEW

The proposed action alternative suggests a comprehensive approach for carrying out the provisions of the *General Management Plan*, the *Concession Services Plan*, and the *Draft Yosemite Valley Housing Plan* to reclaim priceless beauty, reduce cars and congestion, and allow natural systems to prevail. Specifically, this alternative calls for removal of certain structures and circulation features, further restoration and protection of recovered land, relocation of other facilities out of sensitive or hazardous areas, and reduction of traffic congestion in Yosemite Valley.

To restore the natural systems in Yosemite Valley, extensive areas are proposed for restoration. These areas are necessary to sustain a variety of natural processes and diverse biological communities. In addition, some developed areas would be reclaimed through the relocation of facilities and services. This approach would markedly enhance the visitor experience in Yosemite Valley. Implementation of the proposed action would allow for approximately 147 acres in the east end of Yosemite Valley to be reclaimed and restored to natural conditions, 82 acres redesigned, and 38 acres developed to accommodate relocated facilities or functions; up to 21 acres in the west end of the valley could be developed. Removing development, including roads and parking, and restoring 147 acres would benefit adjacent natural areas by reestablishing natural hydrological functions and minimizing disturbance.

Alternative 2 proposes an increase in interpretive and educational programs through partnerships with supporting organizations. There would be some new facilities that would provide improved information, orientation, and wayfinding services (see Alternative 2 — Proposed Action maps).

An orientation transfer facility would be located at Taft Toe. Day use visitors arriving on regional transit or by private vehicle would be intercepted there and would board a shuttle to the east end of the valley. Circulation changes in the valley would be made. Some campground facilities damaged or destroyed in the January 1997 flood would not be replaced or rebuilt, rather they would be relocated to areas less prone to severe flooding; however, due to resource constraints, the total number of campsites would be 675 instead of the 756 prescribed in the *General Management Plan.* Reducing campsite numbers would allow for restoration of the hydrologic and geomorphic processes of the river and floodplain, recovery of habitat, reduction of campsite densities, and improved circulation. It would also reduce the danger of flooding in campgrounds.

NATURAL RESOURCE MANAGEMENT

This alternative uses the GIS composite resource analysis to the greatest extent possible as guidance for planning actions directed toward achievement of the goal of allowing natural processes to prevail.

A 75-meter management zone along both sides of the Merced River and a 50-meter management zone along both sides of Tenaya Creek would be created in which most development would be removed except some pathways and bridge crossings. This management zone would allow for restoration of riparian and aquatic communities immediately adjacent to the Merced River and Tenaya Creek and would serve as a wildlife corridor.

The historic Stoneman, Ahwahnee, and Sugarpine Bridges along the Merced River would be removed and the riverbanks restored to a more natural condition. Removal of these bridges would allow for more natural hydrological processes along this section of the Merced River. Flood effects experienced during the January 1997 flood in the Lower Pines and Rivers Campgrounds were attributed, in part, to



Figure 1: Stoneman Bridge — Existing Conditions

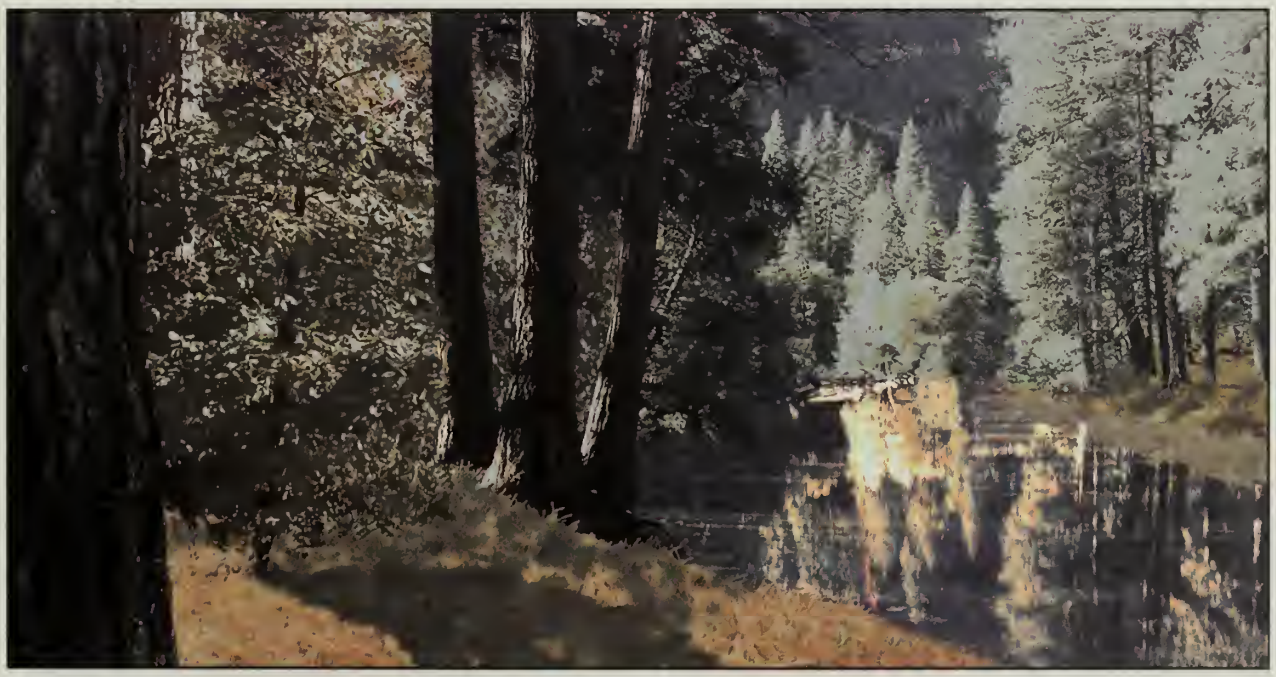


Figure 2: Stoneman Bridge — Proposed Restoration Simulation



Figure 3: Ahwahnee Bridge — Existing Conditions



Figure 4: Ahwahnee Bridge — Proposed Restoration Simulation



Figure 5: Sugarpine Bridge — Existing Conditions



Figure 6: Sugarpine Bridge — Proposed Restoration Simulation



Figure 7: Ahwahnee Meadow — Existing Conditions



Figure 8: Ahwahnee Meadow — Proposed Restoration Simulation



Figure 9: Lower Pines Campground — Existing Conditions



Figure 10: Lower Pines Campground — Proposed Restoration Simulation



Figure 11: Upper Pines Campground — Existing Conditions



Figure 12: Upper Pines Campground — Proposed Restoration Simulation

the inadequate capacity of these bridges to convey the full flood discharge, which allowed excess flow to cut across river meanders and over bridge abutments.

Alternative 2 proposes the removal of roads through Cook's, Stoneman, and Ahwahnee Meadows. This would restore the natural wet characteristics of these meadows by removing the roads that divert both ground and surface water. Conifers on meadow margins would be managed to promote open stands of varied age classes.

All of the campsites in the river management zone of the Merced River and Tenaya Creek and much of the fill brought in to create level campsites would be removed and the area restored to mixed conifer and riparian habitat. Historic base maps would be referenced to recreate the area as it was before development. After restoration efforts were complete, natural processes would prevail.

The concessioner stables and Lamon orchard would be removed the area developed to accommodate relocated campgrounds.

CULTURAL RESOURCE MANAGEMENT

Implementation of this alternative would provide for a comprehensive approach to management of cultural resources and landscapes and would increase the understanding of the relationships between the natural and cultural environments. All cultural resources would be treated in conformance with laws, regulations, and guidelines, including the National Historic Preservation Act, the *Secretary of Interior's Standards for Rehabilitation of Historic Buildings* and the *Secretary's Guidelines for Archeology and Historic Preservation*, and the policies of *NPS-28: Cultural Resource Management Guideline* (NPS 1994).

Many historic buildings and cultural landscapes would be restored, rehabilitated, stabilized, adaptively used, or removed. Historic, archeological, and ethnographic sites and roads and trails would be preserved, tested, and analyzed, and some would be excavated and salvaged.

The cemetery pathways, landscaping, and interpretive signs would be upgraded. The museum, archival, and library collections would be housed in a new facility in the village maintenance area.

In the Ahwahnee Hotel complex (a national historic landmark and national register site) two parking areas would be removed or significantly revised. All other elements in the Ahwahnee complex (except those revised by earlier plans) would be retained, preserved, and maintained.

At the Camp Curry historic district the old registration office would be restored and rehabilitated for adaptive use as a tour and information facility. Curry orchard would be removed and the area restored to natural conditions.

The historic Sugarpine, Ahwahnee, and Stoneman Bridges would be removed to allow a more natural flow of the Merced River. Mitigative measures, including documentation, would be developed in consultation with the state historic preservation officer.

INTERPRETATION, VISITOR SERVICES, AND TRANSPORTATION

This alternative proposes revising in-valley transportation modes to provide access to many west valley features and trails. It would also significantly increase information and orientation services. Access to active, passive, and social recreation would change, but most activities would continue to be available.

There would be no private vehicle access to scenic features or interpretive and recreational sites in the valley. Visitors would park their cars at an orientation/transfer facility in the west end of the valley, at their lodging or campground, or in a gateway community. They would move between destinations in the valley by shuttle bus, bicycle, or on foot. Two new visitor facilities would accompany this change. The first would

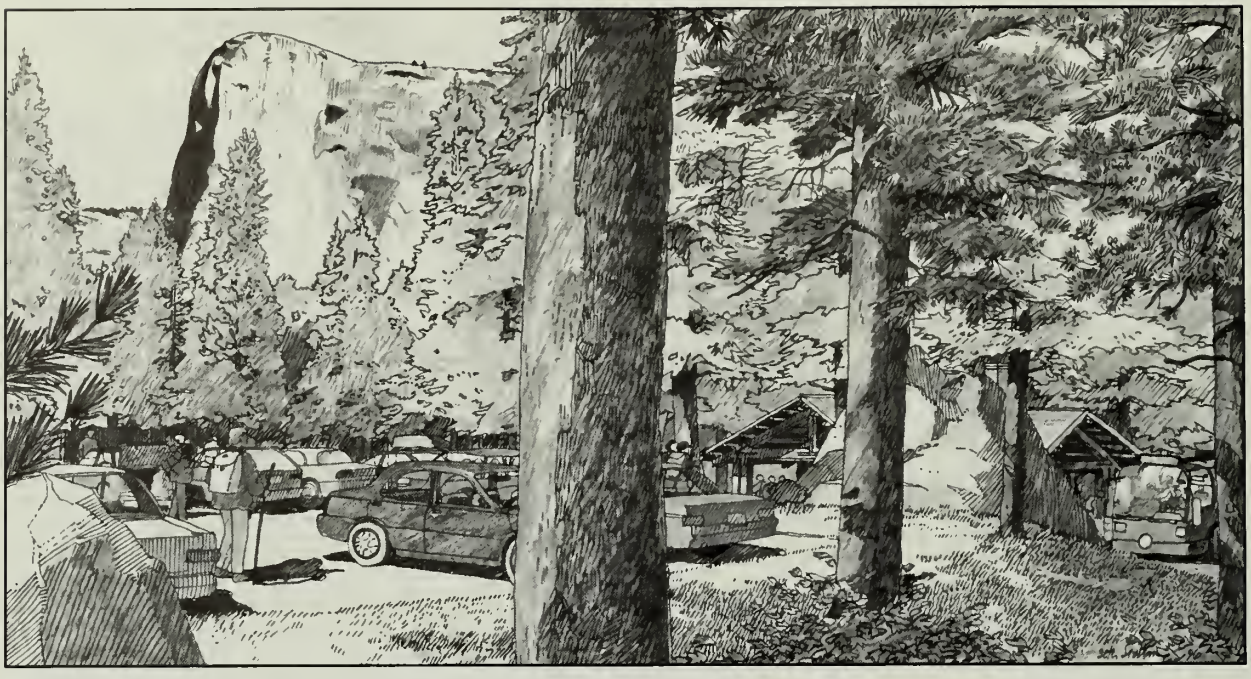


Figure 13: Visitor Orientation/Transfer Facility at Taft Toe — Concept Sketch

be an orientation and transfer facility at the west end of the valley; the second would be a primary information and interpretation center and shuttle bus transit station in Yosemite Village. The present visitor center structure would be removed, but the two auditoriums would remain in place. Their exterior facades and interior spaces would be redesigned and remodeled to accommodate continued interpretive and educational uses. A new outdoor informal seating space and fire circle would be created at the site of the present visitor center, which would be used for interpretive programs and public viewing. Interpretive services would be increased to promote visitor understanding and to provide additional opportunities for enjoyment of the park without touring with personal automobiles.

Equipment design and system management would play major roles in making the shuttle bus system a viable alternative to the personal automobile. Routes, schedules, stops, comfort, and aesthetics would be defined during planning and design. Equipment, routes, and transfer points would be planned with consideration of the needs of people with disabilities (using universal design concepts) and for proximity to sites and pickup locations rather than only for efficiency. Capacity requirements would be analyzed to ensure adequate seating; schedules would be developed in response to visitor use time frames. Cargo storage would separate gear from passengers transporting equipment for recreational activities; seats would be comfortable, and windows would be large. Special routes could be run to meet the needs of special groups such as rock climbers and wilderness users.

Parking at the west valley orientation/transfer facility would be secure. Security lighting would be designed to be unobtrusive and would be limited in intensity.

Information / Orientation

Visitors using the day use reservation system or out-of-park transit would access a new visitor orientation/transfer facility in the west end of the valley. There they would find orientation to transportation services including alternative

methods of accessing the east end of the valley, such as hiking trails, the valley floor tour, and bicycles. Interpretive staff would be available at a small information desk and roving the area. Free interpretive literature would be available, as would a selection of interpretive guides for sale. Basic information needs, such as weather and road conditions and safety and resource management regulations, would be posted. There would be comfort stations, telephones, bicycle rentals, and a place to board either the valley connector shuttle or the valley floor tour tram.

The valley circulator shuttle bus system would be expanded to accommodate all visitors. The circulator shuttle bus routes for the valley would link at the village transit station (currently Village Store) and could be taken to all major destinations in the east end of the valley. The valley circulator shuttle bus system would continue to provide free shuttle service to all east valley destinations and would continue to make stops at the village transit center and the village museums via the shuttle road.

Shuttle bus stops would be clearly identified throughout the valley. System displays and maps and other materials would ensure that visitors could use the system with ease and efficiency.

Visitors with overnight accommodation reservations would not use the west end orientation/transfer facility, but could drive directly to lodgings or campsites and park vehicles there for the duration of their visits. These visitors could obtain information at small unstaffed information/orientation areas in the Ahwahnee Hotel and Yosemite Lodge registration lobbies and at Curry Village in the restored old registration building. Valley campgrounds would have similar information and visit planning opportunities at a new campground information center at the campground checkpoint at the former Boys Town site and at kiosks in the campgrounds.

All visitors would have access to information and orientation at a staffed desk in the village interpretive center/transit station at the site of the Village Store.

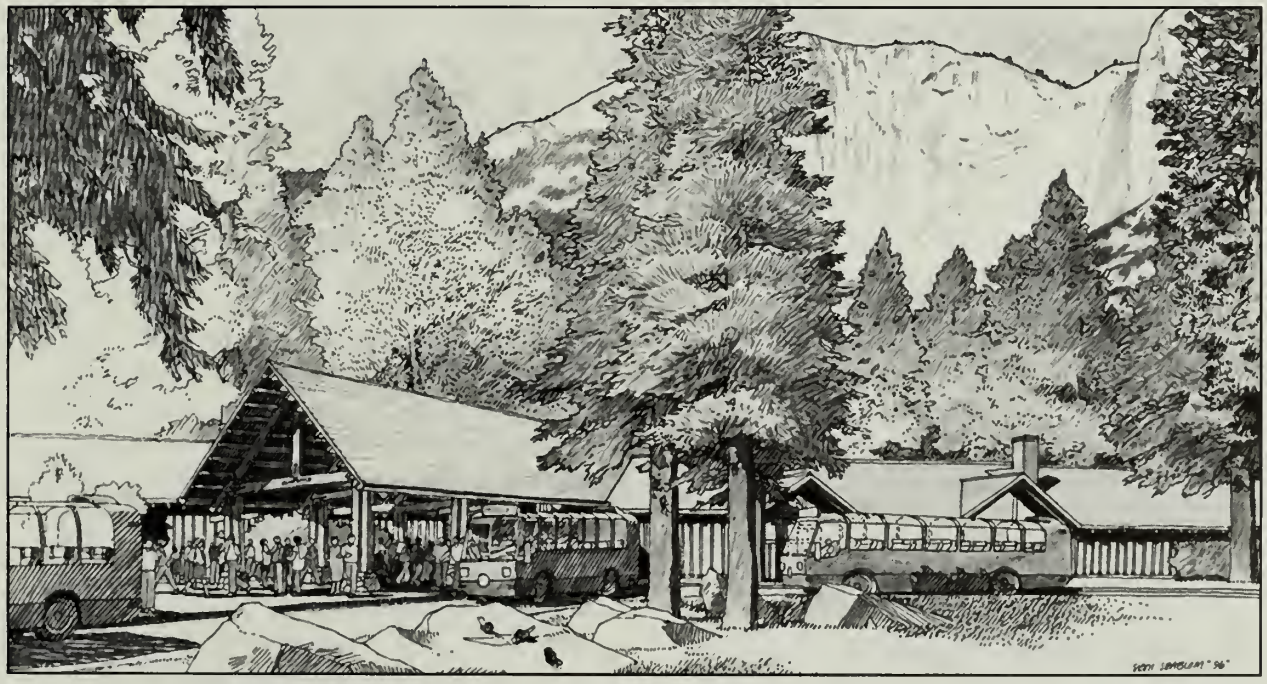


Figure 14: Yosemite Village Information/Interpretation/Transit Station — Concept Sketch

Interpretation / Education

The village interpretive center/transit station in the former Village Store would become a staffed shuttle system transfer point, as well as an information and interpretive center providing park information and orientation programs. Of special importance here would be the presentation of parkwide themes. A new structure would replace the present building if value analysis and architectural evaluation determine that it could not be successfully adapted for the new functions.

The Yosemite museum would expand to fill most of the building at its current location, becoming the human history museum. The current administration building would be renovated and become a new natural history museum. The cemetery would continue to be accessible to visitors. Path locations would be revised to avoid trampling graves and to assist natural revegetation of the site.

The Indian Village of Ahwahnee would be expanded. A wayside exhibit would be located at the sites of Curry and Lamon orchards to preserve and communicate their history. The nature center at Happy Isles would be winterized for year-round interpretive use.

Two new and larger amphitheaters in Upper and North Pines Campgrounds would be provided as part of the effort to relocate campsites away from the Merced River. The Lower Pines amphitheater would be removed. There would be well marked paths from Lower Pines Campground to the Upper Pines amphitheater, where evening programs would be held. Program announcements and folders would include maps and suggested routes. The new amphitheaters would have a large enough capacity to accommodate attendance from all of the nearby campgrounds.

Turnouts would be retained or relocated to provide good interpretive stops for the valley floor tour. Increased emphasis would be placed on interpretive trails and the interpretation of features more easily accessed by bicycle. Self-guiding tour aids would continue to be developed for walkers, bicyclists, and bus riders.

The library, archive and museum collections would be moved to a new facility in the village maintenance area and clearly signed for visitors. Storage, research, curatorial office, and viewing areas would be provided.

Recreation

There would no longer be auto touring in Yosemite Valley, but guided tours and shuttle bus riding would be expanded. Tour folders would be available at the west valley transfer/orientation center. Use of private cars for transportation to recreation sites or trailheads or for the storage of food and equipment would no longer be possible.

There would be more designated hiking and biking trails in a system that would be made more understandable and usable by the visiting public. Bicycle rentals would be available at the west valley center and the Yosemite Village transit center. Interpretive displays and programs would encourage people to use the trail system to experience the many natural and cultural resources. Rest areas with adequate seating would be developed at scenic locations along the trails to allow for rest and contemplation. Bicycle racks would be provided throughout the valley.

Although fewer campsites would be available, campers would be able to choose among three different types of camping: RV, auto/tent, and walk-in/tent. In the east end of the valley the first tier of campgrounds would be available to all three types of campers. The second tier would be designed for auto/tent campers, although walk-in tenting would be allowed. The third tier would be made up entirely of walk-in sites. Each tier would be separated by a stream channel. This arrangement would allow for a variety of experiences and degrees of quiet. The new group campground would be located on a resilient site across the shuttle road from Upper Pines, with easy access to the Happy Isles fen and Glacier Point apron and adjacent to steep talus and scree slopes. Where feasible, campsite densities would be reduced by design and revegetation.

All formal picnic sites would be retained. Picnic areas would be accessible only by shuttle, bicycle, or on foot. Shuttles would be designed to carry picnic equipment. Although there are no designated sites, the river near Pohono Quarry would be accessible for picnic use.

Wilderness hiking would continue to originate in the valley. Walking and day hiking would continue, and there would be more opportunities to hike in areas free of autos, buses, and shuttles. There would be fishing available in the valley's river management zones.

Rock climbing opportunities would continue. Hang gliding might continue on certain days. Ski and ice skate rental would be available at Curry Village at the new ice rink pavilion.

Lockers would be provided at convenient locations throughout the valley for storage of gear and valuables that previously might have been stored in private automobiles. Shuttle buses would be designed to transport a variety of goods and recreational equipment.

DEVELOPMENT

Valley General

Primary visitor transportation to the park would continue to be by private vehicle, tour bus, or out-of-park shuttle bus. The Yosemite Regional Transportation Strategy, which includes the National Park Service and its regional partners, would attempt to develop a regional transportation system through mutual efforts by summer 2001. The National Park Service would reinforce the regional transportation system through actions in the valley.

Campsites would be reduced from the GMP number of 756 to 675. Portions of developed areas and facilities, including lodging, campgrounds, interpretive facilities, retail and food facilities, NPS and concessioner administrative facilities, maintenance support facilities, and employee housing, would be removed or redesigned using the *General Management Plan,* *Concession Services Plan,* and *Draft Yosemite Valley Housing Plan* for guidance. Specific proposed actions are presented below for each valley developed area.

Vehicle access to the east end of the valley would be restricted to overnight lodging and campground guests with reservations, and vehicles would be parked until departure. Yosemite Valley residents and visitors would be provided limited or emergency access to the vehicle fueling facility in the NPS maintenance area.

Circulation changes in the valley would include converting Southside Drive to two-way traffic from Taft Toe to Curry Village (see Alternative 2 maps). Northside Drive from Yosemite Falls west to the El Capitan Bridge would be closed to automobiles, tour buses, and shuttles and would become a path for bicycle, pedestrian, and emergency vehicle use. Depending on the resulting use levels, the width of the road could be reduced and the unused portion of the roadbed could eventually be removed and restored to a natural condition. Outbound visitors would exit the valley via Southside Drive, over El Capitan Bridge, and west along Northside Drive. A new bicycle bridge would be constructed over the river at Cathedral Beach to permit safer access from the transfer facility to the northside bicycle path. The Old Big Oak Flat Road alignment and adjacent areas on the El Capitan moraine would be redesigned with walking and bicycle trails and a series of small picnic areas and vista points for viewing climbers on El Capitan.

Stoneman, Ahwahnee, and Sugarpine Bridges would be removed and the riverbanks restored. Pedestrian and bicycle use of paths and trails would continue. Some patterns and alignments would be relocated to permit easier access in the valley's new circulation scheme.

Parking for 2,300 day use vehicles would be removed from all valley developed areas and roads. Parking for 1,340 overnight guest vehicles would remain at lodging and campground areas (excluding 440 overnight spaces at Yosemite Lodge and 100 spaces at Sunnyside Campground); there would be 40 overnight bus spaces.



Figure 15: Discovery View (Wawona Tunnel) — East view towards Half Dome
— Existing Conditions
— Orientation/transfer facility at Taft Toe not visible



Figure 16: El Capitan Meadow — Southeast view towards Taft Toe — Existing Conditions
— Future view of orientation/transfer facility at Taft Toe screened by tree line

Visitor Orientation / Transfer Facility

In an effort to enhance the visitor experience and preserve the resources at Yosemite, the National Park Service intends to proceed with a plan to significantly reduce the level of private vehicle traffic in Yosemite Valley. As noted in the *General Management Plan*, the National Park Service considers a regional approach to transportation issues to be the preferred solution to traffic congestion in the park. A transfer facility is proposed at Taft Toe to facilitate and complement the current efforts to develop a comprehensive regional transportation system. The Taft Toe facility, however, would provide a short-term solution to vehicle congestion in the event that a regional system were not developed.

The National Park Service would construct an orientation/transfer facility approximately 2.9 miles west of Yosemite Village (see Alternative 2 maps). This facility would serve as the point of arrival for Yosemite Valley visitors. When visitors arrived at the facility via regional transit bus, they would have access to basic orientation information. Visitors could then walk, ride a bike, picnic, or use a shuttle bus. Buses would run to the visitor center in Yosemite Village and to trailheads, picnic areas, and other sites between Taft Toe and Yosemite Village.

It is the intent of the National Park Service and the YARTS group that the regional transportation system would eliminate the need for any day use visitor parking at Taft Toe. YARTS anticipates that a regional system will be fully operational by summer 2001. Based on that schedule, the National Park Service proposes to defer consideration of a parking facility at Taft Toe until the completion of the orientation / transfer facility at Taft Toe, but not before summer 2001. Upon completion of the facility, the National Park Service would confer with YARTS to assess the status of the regional transportation system and its capacity to serve day use visitors. The system's capability would guide the NPS' determination of the need for and size of a parking area at Taft Toe.

In the event that a viable regional system has not been established by 2001 that meets mutually defined objectives, the National Park Service would proceed with the construction of an at-grade parking area at Taft Toe. This would offset the parking removed in the east end of the valley. The parking area would provide for no more than 1,940 parking spaces (1,800 for day use visitors, 120 for backcountry users, and 20 for tour buses). The parking area would be designed to minimize impacts to scenic and natural resources in the valley. This would be accomplished by locating the parking area in a mixed-conifer forest that is resistant to impacts from development. The parking area would be constructed using pods to maximize the use of forested and vegetated areas for screening. The number and arrangement of these pods would allow for easy removal.

The National Park Service recognizes that the regional system may not reach its target capacity by the summer of 2001 but may be able to serve a significant number of visitors. In that event, the system's capabilities might alleviate the need for a 1,940 space parking area and allow plans for parking at Taft Toe to be scaled back. As the regional system continued to evolve, the National Park Service would commit to phasing out parking at Taft Toe in proportion to the system's growing capacity. The ultimate goal would be to eliminate all day use parking from the site. The National Park Service proposes periodic reviews (at least every two years) of the regional transportation system with the YARTS system board. The purpose of the meetings would be to assess the capabilities of the regional system to reduce traffic congestion. Based on the increased growth of the system, a corresponding number of spaces would be promptly removed from Taft Toe.

YOSEMITE VILLAGE

Implementation Concept

The visitor to Yosemite Village would find a variety of interpretive facilities, including a visitor center, two museums, and an amphitheater. The information / interpretive / transit station would be the east valley shuttle hub. From there the visitor could take a shuttle on any of three routes. Visitors would arrive by shuttle bus or bicycle or on foot. Visitor information, interpretation, and service activities would be the primary purposes of the Yosemite Village core area.

Food and Retail Services

The Village Store building would be adaptively used or reconstructed to serve as a visitor interpretation, information, and transit station for visitors arriving on circulator shuttle buses. Space would be provided for interpretive exhibits, information services, food service, a Yosemite Association bookstore, and adjacent bicycle rental. Gift sales would also continue to be provided but to a lesser degree. The Village Grill would be expanded to provide indoor seating for 40, and the deck would be reconfigured to provide outdoor seating for 370. The grocery store function would be relocated to the Degnan's building. Recycling, ATM, check cashing, and transportation kiosk functions would be retained but could be relocated. A short-term storage facility for day users' belongings would be designed into the building.

The Degnan's building, which currently houses a deli, restaurant, grill, and retail gift sales, would be adapted or reconstructed for use as the village grocery store. A deli would be retained but other functions removed. The restaurant on the second floor might be retained under the design conversion.

Circulation and Parking

Visitors would arrive from the orientation/transfer facility at Taft Toe via the valley connector shuttle bus system except when en route to overnight accommodations (see Alternative 2 maps). Shuttle bus traffic would access the village by two-way realigned road from Southside Drive and Sentinel Bridge, Yosemite Lodge, and the Ahwahnee Hotel. Roads across Ahwahnee Meadow and Cook's Meadow would be removed and the meadows would be restored to natural conditions.

Circulation for residents in the Yosemite Village residential areas would remain unchanged.Day use visitor parking (669 spaces) would be removed from Camp Six and the Village Store (new transit station). Camp Six would be restored to a riparian system with braided river channels. The Village Store would be redeveloped to serve as the new transit station and primary visitor center and would include areas of green space. Parking behind Degnan's and the post office would be retained for use by residents but reduced in size.

New bicycle paths would be provided around the edges of proposed shuttle routes and village roads to reduce conflicts with pedestrians and vehicles. Routes would be established along the edge of the village transit station and along the southern edge of Ahwahnee Meadow near the river as a combined bicycle and pedestrian trail. Bicycle trails would be retained from Yosemite Village to Yosemite Lodge and other east valley destinations where possible.

AHWAHNEE HOTEL

Implementation Concept

The Ahwahnee Hotel would be retained as a visitor destination area. Overall visitor arrival, wayfinding, parking, and circulation patterns would be improved.

Circulation and Parking

The two-way Ahwahnee Hotel road would continue to serve as the primary entrance route and access for guests arriving at the hotel. The arrival at the porte co-chere would be revised and redesigned. The historic layout for hotel circulation and parking would also be incorporated where feasible during the design process. The bicycle path from the village to Sugarpine Bridge would be retained and relocated between the Ahwahnee cottages and the Merced River to connect with the Mirror Lake bicycle path. Road and trail alignments would be restored to natural conditions.

The shuttle bus stop for the Ahwahnee Hotel would be retained in its current location.
To restore hydrological processes to the Merced River, the historic Ahwahnee, Sugarpine, and Stoneman Bridges would be removed along with the road section and causeway that connects the Ahwahnee and Sugarpine Bridges.

Parking spaces for overnight hotel guests, cottage guests, and staff (132 spaces) would be provided at the Ahwahnee Hotel.

CAMPGROUNDS

Implementation Concept

Visitors would arrive at the campgrounds by driving through the Curry Village complex, which would have camper services, including a grocery store. There would be one campground checkpoint at the east end of Curry Village. The campgrounds, Housekeeping Camp (lodging), and nature center at Happy Isles would be retained as visitor destination areas, although some campground locations would be changed. Overall visitor arrival, wayfinding, parking, circulation patterns to the campgrounds, and nature center at Happy Isles would be improved. Nonessential facilities would be removed, and other facilities would be relocated from sensitive habitat, which would be restored to natural conditions.

Campground Unit Summary

Due to damage sustained in the January 1997 flood, campground numbers would be reduced by 81 sites, leaving a total of 675 campsites. Campsites would be relocated out of sensitive river habitat and away from potential flood areas. Overall campsite density would be reduced and circulation patterns improved. Campground amenities, roads, and trails would be removed from the Merced River management zone, and the riverbanks and riparian areas would be restored.

At Lower Pines, 107 sites would be removed due to flood damage, and 71 would be retained. All campsites (262) at both Upper and Lower River Campgrounds would be relocated to other campground locations, and the area recovered as part of the restoration of Ahwahnee Meadow and the Merced River management zone. Upper Pines Campground would contain 361 campsites in three distinct units, and North Pines would have 164 sites in two units.

The amphitheater in Lower Pines Campground would be removed. Two new amphitheaters would be provided at Upper Pines and North Pines. Upper Pines Campground would be expanded to absorb the relocated campground sites. The primary access for Upper Pines Campground would be realigned through a portion of the Happy Isles shuttle bus road. The recreational vehicle dump station would be relocated away from the river and placed near the new campground registration checkpoint in the Boys Town area.

North Pines campground sites in the Merced River and Tenaya Creek management zones would be removed and the areas restored. North Pines Campground would be expanded east into the Lamon orchard and concession stable area to absorb removed campsites from Rivers Campgrounds and along the Merced River and Tenaya Creek. All campsites at walk-in and group campgrounds would be relocated to restore the banks of Tenaya Creek. A pedestrian bridge to the new walk-in campground would be provided in a new location upstream, which would lessen

impacts on the creek. The group campground would be relocated adjacent to Upper Pines and west of the nature center at Happy Isles. Table 5 presents the summary of campsites at the valley campgrounds under alternative 2.

The campground registration building would be removed and replaced by a new registration and information checkpoint near the former Boys Town employee tent cabin site adjacent to Curry orchard. A campground information center is proposed for this location to provide park information and visit planning.

The former Curry dump site would be developed for campground maintenance functions and NPS/concession stock staging (summer only, relocated from Yosemite Village and the North Pines area). The concession stable would be removed from the valley.

TABLE 5: ALTERNATIVE 2 CAMPGROUNDS SUMMARY

Number of Sites	Location
0	Lower River (remove 137 sites)
0	Upper River (remove 125 sites)
71	Lower Pines (remove 102 sites)
162	Upper Pines (redesign as 3 campgrounds — Upper Pines, Clarks, Happy Pines)
135	Clarks
64	Happy Pines
60	North Pines (remove 25 sites)
104	Lamon orchard (add 104 sites)
30	Walk-in, Tenaya Creek (add 7 sites)
38	Walk-in, Sunnyside
11	Group, Happy Isles
675	**Total**

Food and Retail Services

The Happy Isles snack stand would be reconstructed near the restrooms.

Circulation and Parking

Northside Drive from Yosemite Village through the River Campgrounds to the intersection with Southside Drive would be removed and the meadow restored. The bicycle path from the village to the east side of Sugarpine Bridge would be realigned. Removed road and trail alignments would be restored to natural conditions.

New shuttle bus stop locations for all the campgrounds would be provided. The Happy Isles shuttle bus loop road would be retained as a one-way circulator for shuttle bus service to the nature center at Happy Isles and trailhead to Nevada Falls from valley developed areas. The shuttle road segment from Southside Drive to the former Curry dump would be realigned to permit expansion and redesign of the campsite loops in Upper Pines Campground and would also serve for campground access.

The pedestrian bridge over Tenaya Creek that connects the North Pines/Lamon Orchard Campground to the walk-in camp would be removed and relocated farther upstream at the new walk-in camp, which would allow hydrological processes to be restored. All other Merced River vehicle and pedestrian bridges in the east end of the valley (except Stoneman, Sugarpine, and Ahwahnee) would be retained. These include the Housekeeping Camp pedestrian bridge and the Clarks and Happy Isles vehicle bridges.

Campground parking would be retained at individual campsites. Parking for the new walk-in camp (40 spaces) would be provided at the North Pines Campground where the concessioner stables were located.

CURRY VILLAGE

Implementation Concept

Curry Village would continue to function as a major visitor destination area and major stop for

the overall valley shuttle system. All vehicles would access Curry Village (and valley campgrounds) from a realigned Southside Drive, which would be located at the periphery of the lodging facilities away from Stoneman Meadow. Improvements would be made to some lodging facilities, while others would be reduced and relocated away from sensitive resources or hazard areas.

The visitor arrival sequence and wayfinding would be substantially improved without compromising the historic rustic character of the Curry Village area. Day use visitor parking would be removed from Curry orchard and the area would be restored to natural conditions. Some facilities, locations, and circulation patterns in Curry Village would remain unchanged. The Huff House (employee housing) would be removed.

Lodging Area

Stoneman Lodge would be adapted to serve as a new guest registration/administration building. The previous registration building would be adapted as a visitor tour and information center. Lodging rooms from Stoneman Lodge would be replaced in a new structure. Access corridors and wayfinding would be retained and improved in the developed area of Curry Village.

Food and Retail Services

The pizza shop would remain in its current location and would be improved to mitigate noise impacts on the amphitheater.

The Curry ice rink would be retained at its current location and the site would be redesigned to remove excess parking and pavement. The mountain and sport shops, bicycle, and ski rental functions would be relocated to the ice rink area to consolidate space and recreational uses. The Curry Pavilion convenience store would be expanded to include grocery/deli functions and to serve as a central camp store. Propane service for campers would be provided near the relocated dump station.

Circulation and Parking

The intersection where Southside Drive intersects with Northside Drive and the Curry Village access road would be redesigned as a two-way road to Curry Village and the valley campgrounds. Northside Drive from the former intersection north through Ahwahnee Meadow and Southside Drive through Stoneman Meadow north of the former Curry orchard parking would be removed and hydrological and other natural processes restored. Southside Drive would be realigned to Curry access road south of the former Curry orchard parking through Boys Town to the valley campgrounds and Happy Isles.

The access road to Southside Drive at the west edge of the orchard parking area would be removed and restored. The one-way entry loop road for lodging registration and registration parking would be retained, but registration parking would be redesigned to provide 20 parking spaces. The drive through to Huff House and the adjacent 30-space parking area would be removed and the area would be restored.

Parking spaces for 437 day use vehicles at Curry orchard would be removed and the area restored to natural conditions. Overnight tent cabin guest parking would be redesigned and expanded from 195 spaces to 260 spaces south of Curry orchard, including a 20-space overnight bus parking area. The guest cabins parking area at the west end of Curry Village would be redesigned and expanded from 150 overnight guest spaces to 190 spaces. The 47 parking spaces at the ice rink would be removed, and the area restored. The rink would be accessed by a new service drive off the registration loop.

Shuttle bus stops would be retained near the registration loop and along the new Southside Drive through Curry Village to the campgrounds and the Happy Isles loop road. The bicycle trail route along Southside Drive from Stoneman Bridge to the campgrounds would be removed

along with the road section. A new trail route would be provided through Curry Village to the valley campgrounds and nature center at Happy Isles.

PARK OPERATIONS

The NPS stables would be relocated to the McCauley Ranch near Foresta and camp maintenance operations would be relocated to the former Curry dump site west of Upper Pines Campground. Remaining maintenance, emergency, and protection functions would be housed in smaller, architecturally compatible structures in the NPS maintenance area, as would the concessioner's shuttle bus servicing. A combined NPS/concessioner vehicle fueling facility would provide limited or emergency access to valley residents and visitors. Yosemite Valley would become a district rather than a base for operations parkwide.

As technology allows, the Pacific Bell building would be removed or redesigned in the maintenance area (or accommodated in other structures).

Staffing levels for this alternative would be as described under "Actions Common to All Alternatives." The park's volunteer program would continue to supplement park staff, particularly in interpretive and educational activities. The program would be enhanced where possible.

DEVELOPMENT COSTS AND PHASING

The one-time development costs for alternative 2 would be $141,682,000 (see appendix A for a breakdown of costs for this alternative). The phasing schedule that follows presents the anticipated order for completing the various actions. Some rearrangement of actions could become necessary due to operational or funding concerns. Other actions could be scheduled to promote and facilitate the development of a regional transportation system. Many actions could be completed with flood recovery funding and could be finished prior to unfunded actions. Phasing of some actions would be dependent on solutions related to employee housing.

TABLE 6: IMPLEMENTATION PHASING SCHEDULE

VALLEY AREA	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Valley General	Remove residence one (former supt. Residence) and garage; restore site to appropriate habitat Through related YARTS process, complete and implement planning for regional transportation system	Develop west valley orientation/ transfer facility at Taft Toe Convert Southside Drive to two-way vehicle traffic from Curry Village west to El Capitan Bridge Remove miscellaneous day use parking spaces from valley roads	Convert Northside Drive to bike/ pedestrian path from Yosemite Lodge west to El Capitan Bridge; restore road surface to riparian habitat Remove Northside Drive from Ahwahnee Meadow; restore roadbed to meadow habitat	Develop realigned bike trail segment through former Rivers Campground along Merced River oxbow Develop realigned bike and pedestrian trail segments through redesigned campgrounds, Yosemite Village, and Curry Village	Remove Stoneman, Ahwahnee, and Sugarpine Bridges from Merced River; remove road prism between Ahwahnee and Sugarpine Bridges; restore riverbanks to riparian habitat
Yosemite Village	Redesign or reconstruct Village Store as interpretive/ transit station Provide interpretive exhibits, visitor information services, and food/ support services at Village Store transit station Relocate NPS corral and campgrounds maintenance to the former Curry dump; remove NPS stables from valley and restore site to habitat	Remove maintenance operations building (Ft Yosemite); redesign area per GMP with smaller combined facilities for valley protection and enforcement functions, dispatch functions, utilities maintenance, and shuttle bus cleaning and servicing Remove Ahwahnee Row houses, apartments, and dorm; restore habitat Relocate YCS fire battalion equipment to combined protection facility in the former NPS maintenance area	Remove YCS garage, storage buildings, fire house, and related development Realign Sentinel Bridge Road to access Village Store transit station; restore segment in Cook's Meadow Redesign Northside Drive alignment along previous shuttle loop; remove Northside Drive segment from Cook's Meadow and restore meadow habitat Remove day use visitor parking at Village Store Redesign/rehabilitate Degnan's for valley grocery function and visitor food service (see also Curry Village)	Remove Camp Six day use parking development; partially restore riparian habitat Provide replacement parking for Lower Tecoya employee housing; restore remaining area to habitat Remove NPS and YCS administrative headquarters functions from valley; remove YCS building and restore site; adapt NPS building for natural history museum	Remove construction staging area from Camp Six; complete restoration to riparian habitat Provide expanded child care facility in or adjacent to housing area Remove visitor center structure; redesign for outdoor amphitheater space and rehabilitated auditoriums

VALLEY AREA	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Curry Village		Remove YCS tent cabin employee housing (Terrace & Boys Town) as prescribed in draft housing plan; restore Terrace site to habitat Remove Huff House employee housing as prescribed in draft housing plan, including adjacent parking and access road; restore to habitat Redesign Curry Pavilion for expanded indoor and outdoor seating; enlarge grocery function and add deli; mitigate noise to amphitheater	Remove Southside Drive from Stoneman Meadow and realign adjacent to Curry Village; remove boardwalk from the meadow; restore meadow habitat Remove excess day use parking at ice rink; redesign area for relocated mountain sports center, bicycle, ski, and skate rentals Provide permanent campground checkpoint, campground information center, and overnight tour bus parking (20 buses) Remove intersection at Southside Drive and Curry Village entry road; restore as part of removal of Stoneman Bridge to meadow and riparian habitat	Remove Curry orchard and day use visitor parking (about 300 spaces); restore to meadow habitat; redesign lower portion of orchard for overnight guest parking Reduce tent cabin lodging (remove 276 tents, retain 150); restore disturbed site areas Rehabilitate cabins with bath (103 rooms); provide replacement rooms for Stoneman Lodge (18 rooms) Remove cabins without bath and replace w/ singles, duplex, and quad cabins with bath (80 rooms) Redesign overnight guest parking at Curry Village for 450 spaces	Adapt Stoneman Lodge to registration function Adapt registration building to serve as visitor tour/information center
Ahwahnee Hotel		Remove concessioner employee housing dormitory as prescribed in the draft housing plan; restore habitat			Revise visitor/guest arrival, parking, and delivery circulation

VALLEY AREA	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Valley Campgrounds	Replace or redesign campsites (675) at Lower Pines (71 sites), Upper Pines (162 sites), Happy Pines (64 sites), Clark's (135 sites), North Pines (60 sites), Lamon Orchard (104 sites), Tenaya Creek walk-in camp (30 sites), and Happy Isles group camp (11 sites); retain 38 sites at Sunnyside walk-in camp Provide guest parking for Tenaya Creek walk-in campground on north side of Lamon Orchard campground (30 spaces) Provide temporary campground checkpoint Provide new footbridge to Tenaya Creek walk-in campground upstream of former location	Remove Rivers Campground and portion of Lower Pines Campground and restore habitat	Remove campsites along the 75-meter buffer of the Merced River management zone and 50-meter buffer along Tenaya Creek; restore to mixed conifer and riparian habitat Remove old Tenaya Creek footbridge; restore creek bank habitat	Provide RV dump station and propane service adjacent to campground checkpoint	Remove riverside units at Housekeeping Camp and restore riverbanks to riparian habitat Remove old RV dump station along Merced River; restore riverbank to riparian habitat

ALTERNATIVE 3

OVERVIEW

Alternative 3 proposes actions similar to those described in the proposed action for carrying out the provisions of the *General Management Plan* for Yosemite Valley. As in alternative 2 this alternative calls for the removal of unnecessary structures and circulation features, further restoration and protection of recovered land, relocation of other facilities out of sensitive or hazardous areas, and reduction of traffic congestion in the valley.

In order to restore the natural systems in Yosemite Valley, extensive areas are proposed for restoration. These areas are necessary to sustain a variety of natural processes and diverse biological communities. In addition, some developed areas would be reclaimed through the relocation of facilities and services. This approach would markedly enhance the visitor experience in Yosemite Valley.

Implementation of alternative 3 would allow for approximately 143 acres in the east end of the valley to be reclaimed and restored to natural conditions, 93 acres redesigned, and 38 acres developed to accommodate new and relocated facilities or functions; up to 19 acres in the west end of the valley could be developed. The removal of development, including roads and parking contemplated by the proposed restoration of 143 acres, would benefit adjacent natural areas by restoring hydrological functions and minimizing disturbance.

This alternative (like alternative 2) proposes an increase in interpretive and educational programs through partnerships with supporting organizations. There would be some new facilities that would provide improved information, orientation, and wayfinding services (see Alternative 3 maps).

Alternative 3 proposes a lower level of redesign in Yosemite Village than alternative 2 and approximately the same level of redesign for campground areas, the Ahwahnee Hotel, and Curry Village. Day use visitors arriving on regional transit or by private vehicle would be intercepted at a new orientation / transfer facility at the west end of the valley at Pohono Quarry, and overnight guests would park at lodging areas or in campgrounds. Day use visitors and out-of-park transit bus riders would be intercepted at the orientation/transfer facility and would board shuttles to the east end of the valley. Circulation changes would be made in the valley. Campground facilities damaged or destroyed in the January 1997 flood would be relocated to areas less prone to severe flooding; however, due to resource constraints, the total number of available campsites would be 675 instead of the 756 prescribed in the *General Management Plan.* Reducing campsite numbers would allow restoration of the hydrologic processes of the river and floodplain, recovery of habitat, reduction of campsite densities, and improved circulation.

NATURAL RESOURCE MANAGEMENT

As in the proposed action, this alternative uses the GIS composite resource analysis to guide planning actions directed toward achievement of the goal of allowing natural processes to prevail.

A 75-meter management zone along both sides of the Merced River and a 50-meter management zone along both sides of Tenaya Creek would be created in which most development would be removed except some pathways and bridges, which would allow for restoration of riparian and other communities.

The historic Ahwahnee and Sugarpine Bridges along the Merced River would be removed and their banks restored to a more natural condition. Removal of these bridges would allow for more natural hydrological processes along this section of the Merced River. Flood effects experienced during the January 1997 flood in the Lower Pines and Rivers Campgrounds were attributed

in part to the inadequate capacity of these and other bridges to convey the full flood discharge. This allowed the excess flow to cut across river meanders and over bridge abutments. Removal of these bridges would reduce the proportion of flow entering cutoff channels and over-topping the bridges and would allow a stable bank configuration to develop faster (NPS, Jackson, Smillie, and Martin 1997). Stoneman Bridge would be retained as a bicycle/pedestrian bridge, and its effects on river hydrology would be mitigated to the greatest extent possible without removal.

The roads through Stoneman and Ahwahnee Meadows that divert both ground and surface water would be removed. This would restore the natural wet characteristics of these meadows.

All parking and housing at Camp Six would be removed to allow for restoration. All of the campsites in the river management zones of the Merced River and Tenaya Creek would be removed and the area restored to mixed conifer and riparian communities. All changes to campgrounds would be the same as recommended in alternative 2.

CULTURAL RESOURCE MANAGEMENT

Implementation of this alternative would provide for a comprehensive approach to management of cultural resources and landscapes and would increase the understanding of the relationships between the natural and cultural environments. All cultural resources would be treated in conformance with laws, regulations, and guidelines, including the National Historic Preservation Act, the *Secretary of Interior's Standards for Rehabilitation of Historic Buildings* and the *Secretary's Guidelines for Archeology and Historic Preservation*, and the policies of *NPS-28: Cultural Resource Management Guideline* (NPS 1994).

Historic buildings and cultural landscapes would be restored, rehabilitated, stabilized, and adaptively used. Some would be removed. Historic, archeological, and ethnographic sites, roads and trails would be preserved, tested, analyzed, and some would be excavated and salvaged. Collections would be moved, conserved, and housed in environmentally suitable facilities out of the valley. The cemetery pathways, landscaping and interpretive signs would be upgraded.

In the Ahwahnee Hotel complex (a national historic landmark and national register site) two parking areas would be significantly revised. Day use parking would be removed from Curry orchard, and a new access road would be constructed through the area to the campgrounds.

The historic Sugarpine and Ahwahnee Bridges would be removed to allow a more natural flow of the Merced River. Mitigative measures, including documentation, would be developed in consultation with the state historic preservation officer.

INTERPRETATION, VISITOR SERVICES, AND TRANSPORTATION

This alternative proposes revising in-valley transportation modes to provide access to many west valley features and trails and would significantly increase information and orientation services. Access to active, passive, and social recreation would change, but most activities would continue to be available.

There would be no private vehicle access to scenic features or to interpretive and recreational sites in the valley. Visitors would park their cars in gateway communities, at a parking facility in the west end of the valley, or at lodgings or campgrounds. They would move between destinations in the valley by shuttle bus, bicycle, or on foot. Two new visitor facilities would accompany this change.

The first would be an orientation/transfer facility at the west end of the valley, which would include a major visitor center that would offer substantial interpretive programs relating to the park's resources and significance. There would

be a secondary information and valley-specific interpretive center at the shuttle bus transit station in Yosemite Village. The present visitor center would be retained, if feasible, as an education center providing classrooms and other facilities for environmental education groups. The two auditoriums would remain. These facilities would be redesigned and remodeled to accommodate continued interpretive and educational uses.

Valleywide, the number and breadth of interpretive services would be increased to promote visitor understanding and to provide additional opportunities for enjoyment in lieu of touring by car.

Equipment design and system management would play a major role in making the shuttle bus system a viable alternative to the personal automobile. Routes, frequency, schedules, stops, comfort, and aesthetics would be critical and would be defined during planning and design. Routes would be planned with visitor destinations in mind. Transfer points would consider proximity as well as efficiency, especially for people with disabilities and those transporting equipment for recreational activities. Buses would be accessible to people with disabilities. Special routes could be run to meet the needs of special groups such as rock climbers, wilderness users, and hang gliders.

Parking in the west valley orientation/transfer facility would be secure. Security lighting would be designed to be unobtrusive and would be limited in intensity.

Information / Orientation

All park visitors would have access to the visitor center at the west end of the valley. This facility would offer an orientation film and comprehensive exhibits on park resources, facilities, and activities. Visitors could make lodging and camping reservations, obtain wilderness permits, and plan their parkwide visit at staffed service desks. Restrooms and a bookstore would be available. Near the parking area, visitors would find orientation to transportation services in Yosemite Valley, including alternative methods of accessing the east end of the valley.

The valley circulator shuttle bus system would be expanded to accommodate all visitors. The circulator shuttle bus routes for the valley would link at the village transit station (currently Village Store) and could be taken to all major destinations in the east end of the valley.

Shuttle bus stops would be clearly identified throughout the valley. System displays and maps and other printed materials would ensure that visitors could use the system with ease and efficiency.

Visitors with overnight accommodations in Yosemite Valley would not have to stop at the west end facility but could drive directly to lodgings or campsites.

Interpretation / Education

The village information center/transit station in the former Village Store would become a staffed shuttle system transfer point and would provide park information and orientation programs. Of special importance would be the presentation of parkwide themes. A new structure would replace the present building if a value analysis and architectural evaluation determine that it cannot be successfully adapted for the new functions. The visitor center at Yosemite Village would be retained and evaluated for adaptive use and redesign as an environmental education center.

Wayside exhibits would be located near the historic Curry and Lamon orchards to preserve and communicate the orchards' history.

The nature center at Happy Isles would be winterized for year round interpretive use.

Two new and larger amphitheaters in Upper and North Pines Campgrounds would be provided as part of the effort to relocate campsites away from the Merced River. The Lower Pines amphitheater would be removed. Walks from Lower

Pines Campground to evening programs at the Upper Pines amphitheater would be on well marked paths. Program announcements and folders would have maps and suggested routes. The new amphitheaters would be large enough to accommodate visitors from all of the nearby campgrounds.

Road turnouts would be retained or relocated to provide interpretive stops for the valley floor tour. Increased emphasis would be placed on interpretive trails and the interpretation of features easily accessed by bicyclists. Self-guiding tour aids would continue to be developed for walkers, bicyclists, and bus riders.

The library, archive, and museum collections would be clearly signed for visitors. Storage, research, curatorial office, and viewing areas would be provided.

Recreation

There would no longer be auto touring in Yosemite Valley, but guided tours and shuttle bus riding would be expanded. Tour folders would be available at the west valley transfer/orientation center. Use of private cars for transportation to recreation sites or trailheads would no longer be possible.

There would be more designated hiking and biking trails in a system that would be made more understandable and usable by the visiting public. Bicycle rentals would be available at the west valley center and the Yosemite Village transit center. Interpretive displays and programs would encourage people to use the trail system to experience the many natural and cultural resources. Rest areas with adequate seating would be developed at scenic locations along the trails to allow for rest and contemplation. Bicycle racks would be provided throughout the valley.

Although fewer campsites would be available, campers would be able to choose among three different types of camping: RV, auto/tent, and walk-in/tent. In the east end of the valley the first tier of campgrounds would be available to all three types of campers. The second tier would be designed for auto/tent campers, although walk-in tenting would be allowed. The third tier would be made up entirely of walk-in sites. Each tier would be separated by a stream channel. This arrangement would allow for a variety of experiences and degrees of quiet. The new group campground would be located on a resilient site across the shuttle road from Upper Pines, with easy access to the Happy Isles fen and Glacier Point apron and adjacent to steep talus and scree slopes. Where feasible, campsite densities would be reduced by design and revegetation.

All formal picnic sites would be retained. Picnic areas would be accessible only by shuttle, bicycle, or on foot. Shuttles would be designed to carry picnic equipment. Although there are no designated sites, the river near Pohono Quarry would be accessible for picnic use.

Wilderness hiking would continue to originate in the valley. Walking and day hiking would continue, and there would be more opportunities to hike in areas free of autos, buses, and shuttles. There would be fishing available in the valley's river management zones.

Rock climbing opportunities would continue. Hang gliding might continue on certain days. Ski and ice skate rental would be available at Curry Village at the new ice rink pavilion.

Lockers would be provided at convenient locations throughout the valley for storage of gear and valuables that previously might have been stored in private automobiles. Shuttle buses would be designed to transport a variety of goods and recreational equipment.

DEVELOPMENT

Valley General

The Yosemite Regional Transportation Strategy, which includes the National Park Service and its regional partners, would attempt to develop a

regional transportation system through mutual efforts by summer 2001.

Portions of developed areas and facilities, including lodging, campgrounds, interpretive facilities, retail and food facilities, NPS and concessioner administrative facilities, maintenance support facilities, and employee housing, would be removed or redesigned as prescribed in the *General Management Plan, Concession Services Plan*, and *Draft Yosemite Valley Housing Plan*. Campsites would be reduced from the GMP number of 756 to 675.

Vehicle access to the east end of the valley would be restricted to overnight lodging and campground guests with reservations, and vehicles would be parked until departure.

Circulation changes in the valley would include converting Southside Drive to two-way traffic from El Capitan crossover to Curry Village. Northside Drive from the El Capitan Bridge east to Yosemite Falls would be closed to automobiles, tour buses, and shuttles and would become a path for bicycle, pedestrian, and emergency vehicle use. Depending on the resulting use levels, the width of the road could be reduced, and the unused portion of the roadbed could eventually be removed and restored to natural conditions. Outbound visitors would exit the valley via Southside Drive over El Capitan Bridge and west along Northside Drive. The El Capitan Bridge would be modified to permit bicycle access.

The Ahwahnee and Sugarpine Bridges would be removed and the riverbanks would be restored. Pedestrian and bicycle use of paths and trails would continue. Some patterns and alignments would be relocated to permit easier access in the new circulation scheme.

Parking for 2,300 day use vehicles would be removed from all valley developed areas and roads. Parking for 1,340 overnight guest vehicles would remain at lodging and campground areas (excluding 440 overnight spaces at Yosemite Lodge and 100 spaces at Sunnyside Campground), and there would be 40 overnight bus spaces.

Visitor Orientation / Transfer Facility

In an effort to enhance the visitor experience and preserve the resources at Yosemite, the National Park Service intends to proceed with a plan to significantly reduce private vehicle traffic in Yosemite Valley. As noted in the *General Management Plan*, the National Park Service considers a regional approach to transportation issues to be the preferred solution to traffic congestion in the park. A transfer facility is proposed at Pohono Quarry to facilitate and complement the efforts underway to develop a comprehensive regional transportation system to serve park visitors. The Pohono Quarry facility would provide a solution to vehicle congestion in the event that a regional system is not developed.

The National Park Service would construct an orientation/transfer facility east of Pohono Bridge near the former Pohono Quarry approximately 5 miles west of Yosemite Village (see Alternative 3 maps). This facility would serve as the point of arrival for Yosemite Valley visitors. Once visitors arrive at the facility via regional transit bus, they would have access to orientation, information, and interpretive services. People would then walk, ride a bike, or use a shuttle bus. Buses would run to transit center in Yosemite Village and to trailheads, picnic areas, and other sites between Pohono Quarry and Yosemite Village.

It is the intent of the National Park Service and the YARTS group that the establishment of the regional transportation system would eliminate the need for any day use visitor parking at Pohono Quarry. YARTS anticipates that a regional system will be fully operational by the summer of 2001. Based on that schedule, the National Park Service proposes to defer consideration of a parking facility at Pohono Quarry until the completion of the visitor center / orientation / transfer facility at Pohono Quarry, but not earlier than the summer of 2001. Upon



Figure 17: Discovery View (Wawona Tunnel) — East view towards Half Dome
— Existing Conditions



Figure 18: Discovery View (Wawona Tunnel) — East view towards Half Dome
— Simulated location of orientation/transfer facility at Pohono Quarry

completion of the facility, the National Park Service would confer with YARTS to assess the status of the regional transportation system and its capacity to serve day use visitors to the park. The system's capability would guide the National Park Service in its determination of the need for and size of a parking facility at Pohono Quarry.

In the event that a viable regional system has not been established by 2001 that meets mutually defined objectives, the National Park Service would proceed with the construction of a multilevel parking structure at Pohono Quarry. This facility would offset the parking removed from the east end of the valley. The parking facility would provide for no more than 1,920 parking spaces (1,800 for day use visitors, 120 for backcountry users). A multilevel parking structure would be necessary to accommodate parking and circulation requirements due to limited available land and steep terrain. The facility would be designed to minimize impacts, but would be visible from Discovery View. Because of the level of investment necessary (cost and impacts of construction), this would be a permanent facility.

The National Park Service recognizes that the regional system might not reach its target capacity by summer 2001, but nonetheless could serve a significant number of visitors. In that event, the system's capabilities could alleviate the need for a 1,920 space parking area and allow the NPS to scale back plans for parking at Pohono Quarry. Because of the permanent nature of the facility, it would not be possible to phase out parking over time in relation to the regional system's growing capacity. Eliminating all day use vehicle parking from the site would require substantial additional planning, expense, and restoration.

The National Park Service proposes periodic reviews (at least every two years) of the regional transportation system with the YARTS system board. The purpose of the meetings would be to assess the capabilities of the regional system to reduce traffic congestion.

YOSEMITE VILLAGE

Implementation Concept

The concept for alternative 3 would be the same as for alternative 2. Visitor information, interpretation, and service activities would continue to be the primary purposes of the Yosemite Village core area. All administrative functions for the National Park Service and the concessioner would be relocated out of Yosemite Valley. Essential NPS maintenance, protection, and enforcement functions would be retained in the village along with the concessioner's warehouse/recycling activities and shuttle bus servicing. Most concession visitor services and activities would be retained. NPS employee housing would be provided for required occupants who provide direct services to the public and protect resources, and concessioner housing would be provided only for essential employees who provide direct visitor services in the valley. Others would be relocated outside the valley.

Food and Retail Services

The Village Store building would be adaptively used or reconstructed to serve as a visitor information and transit station for visitors arriving on connector (from the transfer facility) and circulator shuttle buses. Space would be provided for information services and adjacent bicycle rental. The grocery function would remain and gift sales would continue to be provided but to a lesser degree. The Village Grill would be expanded to provide indoor seating for 40 and the deck reconfigured to provide outdoor seating for 370. Recycling, ATM, check cashing, and transportation kiosk functions would be retained but might be relocated. A short term storage facility where day users could check their belongings would be included.

The Degnan's building would continue to house a food services facility, but retail gift sales would be eliminated. The art activity center would be relocated to space in the redesigned Village Store.

Circulation and Parking

Day use visitors would arrive from the orientation/transfer facility at Pohono via the valley connector shuttle bus system except when en route to overnight accommodations. Shuttle bus traffic would access the village by two-way realigned road from Southside Drive and Sentinel Bridge, Yosemite Lodge, and the Ahwahnee Hotel. The road across Ahwahnee Meadow would be removed and the meadow would be restored to natural conditions. The road through Cook's Meadow would remain. Circulation for residents in the Yosemite Village residential areas would remain unchanged.

Day use visitor parking (669 spaces) would be removed from Camp Six and the Village Store area (new transit station). Parking for approximately 20 day tour buses would be provided at Camp Six. Parking behind Degnan's and the post office would be retained for use by residents but would be reduced in size to accommodate proposed employee housing adjacent to the Lost Arrow Dormitory.

New bicycle paths would be provided parallel to the shuttle routes and village roads to reduce conflicts with pedestrians and vehicles. Bicycle trails would be retained from Yosemite Village to Yosemite Lodge and other east valley destinations.

AHWAHNEE HOTEL

Implementation Concept

The Ahwahnee Hotel would be retained as a visitor destination area. Overall visitor arrival, wayfinding, parking, and circulation patterns to the Ahwahnee Hotel would be redesigned. Nonessential facilities would be removed, and other facilities would be relocated from sensitive habitat areas, which would be restored to natural conditions.

Circulation and Parking

The two-way Ahwahnee Hotel road would continue to serve as the primary entrance route and access for guests arriving at the hotel. The guest parking and arrival at the porte co-chere would be redesigned according to historic drawings. The bicycle path to Curry Village would be retained along the previous Northside Drive alignment and across Stoneman Bridge. The bicycle path to Mirror Lake would be relocated between the Merced River and the Ahwahnee cottages and would connect with the current bike path.

The shuttle bus stop for the Ahwahnee Hotel would be retained in its current location.

To restore hydrological processes to the Merced River, the historic Ahwahnee and Sugarpine Bridges would be removed along with the road section and causeway that connects the two bridges. Stoneman Bridge would be retained to serve the bicycle path crossing the Merced River to Curry Village.

Parking spaces for overnight hotel guests, cottage guests, and staff (132 spaces) would be provided at the Ahwahnee Hotel.

CAMPGROUNDS

Implementation Concept

The campgrounds, Housekeeping Camp (lodging), and nature center at Happy Isles would be retained as visitor destination areas, although some campground locations would be changed. Overall visitor arrival, wayfinding, parking, and circulation patterns to the campgrounds and nature center at Happy Isles would be improved. Nonessential facilities would be removed, and other facilities would be relocated from sensitive habitat areas that would be restored to natural conditions.

Campground Unit Summary

Due to damage sustained in the January 1997 flood, campground numbers would be reduced by 81 sites, leaving a total of 675. Campsites would be relocated out of sensitive river habitat and away from potential flood areas. Campground amenities, roads, and trails would be removed from the Merced River management zone, and the riverbanks and riparian areas would be restored.

At Lower Pines, 102 sites would be removed due to flood damage and 71 would be retained. All campsites (262) at both Upper and Lower River Campgrounds would be relocated to other locations and the area recovered as part of the restoration of Ahwahnee Meadow and the Merced River management zone. Upper Pines Campground would be increased to 361 campsites and North Pines would be increased to 164 sites (as two camps).

The amphitheater in Lower Pines Campground would be removed. Two new amphitheaters would be provided at Upper Pines and North Pines. Upper Pines Campground would be expanded to absorb the relocated campground sites. Overall campsite density would be reduced and circulation patterns improved for both Lower and Upper Pines Campgrounds. The primary access for Upper Pines Campground would be realigned through a portion of the Happy Isles shuttle bus road. The recreational vehicle dump station would be retained in its current location.

North Pines Campground sites in the Merced River and Tenaya Creek management zones would be removed and the areas restored. North Pines Campground would be expanded east into the Lamon orchard and concession stable area to absorb removed campsites from Rivers Campgrounds and along the Merced River and Tenaya Creek. Overall campsite density would be reduced and circulation patterns would be improved. All campsites at walk-in and group campgrounds would be removed to restore the banks of Tenaya Creek. A new walk-in campground (30 sites) and pedestrian bridge access would be provided in a new location upstream, which would lessen impacts on the creek.

The group campground (11 sites) would be relocated adjacent to Upper Pines and west of the nature center at Happy Isles. Table 7 presents the summary of campsites at the valley campgrounds under alternative 3:

TABLE 7: ALTERNATIVE 3 CAMPGROUNDS SUMMARY

Number of Sites	Location
0	Lower River (remove 137 sites)
0	Upper River (remove 125 sites)
71	Lower Pines (remove 102 sites)
162	Upper Pines (redesign as 3 campgrounds — Upper Pines, Clarks, and Happy Pines)
135	Clarks
64	Happy Pines
60	North Pines (remove 25 sites)
104	Lamon orchard (new)
30	Walk-in, Tenaya Creek (relocated)
38	Walk-in, Sunnyside (covered in Lodge DCP)
11	Group, Happy Isles (relocated)
675	**Total**

The campground registration building would be replaced by a new registration and information checkpoint near the former Boys Town employee tent cabin site adjacent to Curry orchard. An information kiosk would be provided at the checkpoint.

The former Curry dump site would be developed for campground maintenance functions and NPS/concession corral (summer only, relocated from Yosemite Village and North Pines area). It

would serve as a temporary holding area for wilderness trips.

Food and Retail Services

The nature center at Happy Isles would remain unchanged in its current location and configuration. The snack stand would be reconstructed near the restrooms.

The concessioner stables at North Pines would be removed from the valley at the request of the concessioner. The area would be redesigned for new campsites and camp parking.

Circulation and Parking

Northside Drive from Yosemite Village through the river campgrounds to the intersection with Southside Drive would be removed and the meadow restored. The bicycle path would be retained as an access to Curry Village. The bicycle path from Camp Six to the east side of the Sugarpine Bridge (Mirror Lake) would be removed, and the path from Mirror Lake would be relocated between the Merced River and the Ahwahnee cottages. Road and trail alignments would be restored to natural conditions.

New shuttle bus stops for all the campgrounds, Happy Isles, and trailheads would be provided as appropriate to the expansion and revised layout of campsites.

The pedestrian bridge over Tenaya Creek that connects the North Pines/Lamon Orchard Campground to the walk-in camp would be removed and relocated farther upstream at the new walk-in camp to allow hydrological processes to be restored. Except for Sugarpine and Ahwahnee Bridges, all other Merced River vehicle and pedestrian bridges in the east end of the valley would be retained.

Campground parking would be retained at individual campsites. Parking (40 spaces) for the new walk-in camp would be provided at the North Pines Campground.

CURRY VILLAGE

Implementation Concept

Curry Village would continue to function as a major visitor destination and guest lodging area. Vehicles would access Curry Village (and valley campgrounds) from a realigned Southside Drive along the periphery of the lodging facilities away from Stoneman Meadow. Improvements would be made to some lodging facilities, while others would be reduced and relocated away from sensitive resource or hazard areas.

The visitor arrival sequence, parking, and wayfinding would be substantially improved without compromising the historic rustic character of Curry Village.

Lodging Area

The current registration building would remain unchanged. Access corridors and wayfinding would be retained and improved in the developed area of Curry Village. The Curry ice rink would be relocated to its historic location northeast of the Curry pavilion. The mountain and sport shops and bicycle and ski rental functions would be relocated near the new ice rink to consolidate space and recreational uses.

Food and Retail Services

The pizza shop would remain in its current location. The Curry Pavilion convenience store would be expanded to include grocery/deli functions and to serve as a central camp store.

Circulation and Parking

Circulation would be improved by a new alignment of Southside Drive outside Stoneman Meadow, which would provide more direct access to Curry Village and campground areas. A new bicycle path connecting Yosemite Village, Curry Village, and campgrounds would be provided through the former River Camp-

grounds area. Stoneman Bridge would remain as part of the bicycle path. Northside Drive would be removed through Ahwahnee Meadow, and the area would be restored. The parking area for registration would be redesigned for 24 spaces and access from the registration loop. Parking for 195 vehicles would be provided near the relocated ice rink and tent cabin areas. The west parking area adjacent to the Curry guest cabins would be redesigned for a total of 226 spaces. Shuttle bus stops would be provided for Curry Village. Parking would be removed from Curry orchard. A portion of the area would accommodate the realignment of Southside Drive.

PARK OPERATIONS

The park and concession administrative operations would be similar to alternative 2. The stables and camp maintenance operations would be relocated to the former Curry dump site, west of Upper Pines Campground. Remaining maintenance, emergency, and protection functions, the concessioner's shuttle bus servicing, and an NPS/concessioner vehicle fueling facility would be housed in smaller, architecturally compatible structures. Yosemite Valley would become a district rather than a base for operations parkwide.

As technology allows, the Pacific Bell building would be removed or redesigned (or accommodated in other structures).

Staffing levels for this alternative would be as described under "Actions Common to All Alternatives." The park's volunteer program would supplement park staff, particularly in interpretive and educational activities. The program would be enhanced where possible.

DEVELOPMENT COSTS

The one-time development costs for alternative 3 would be $271,241,000 (see appendix A for a breakdown of costs for this alternative).

ALTERNATIVE 4 — MINIMUM REQUIREMENTS

OVERVIEW

Actions recommended in the *General Management Plan,* the *Concession Services Plan*, and the *Draft Yosemite Valley Housing Plan* would continue to be implemented on a project-by-project basis. Some comprehensive approaches to implementation would be provided, but these would be limited compared to alternatives 2 and 3. The actions would be implemented as funding permitted. Interpretive and educational programs, visitor services, and new facilities would be provided as prescribed in the approved plans. Implementation of alternative 4 would allow for approximately 118 acres to be reclaimed and restored to natural conditions, 95 acres redesigned, and 36 acres developed to accommodate new and relocated facilities or functions.

Alternative 4 proposes a lower level of redesign and change than the other action alternatives. Management policies would change in regard to the relocation of park functions and employees from the valley and the reduction in day use visitor levels.

Day visitors and out-of-park transit bus riders would park vehicles at one of several redesigned lots in the east end of the valley. Overnight visitors with reservations would park at lodging areas or in campgrounds. All visitors would use shuttles to move about the valley. Circulation in the valley would not change, but a west valley shuttle route would be added. Campground facilities damaged or destroyed in the January 1997 flood would be relocated to areas less prone to flooding; however, due to habitat constraints, the total number of available campsites would be 662 instead of 756 as prescribed in the *General Management Plan.* Reducing campsite numbers would allow restoration of the hydrologic processes of the river and floodplain, recovery of habitat, reduction of campsite densities, and improved circulation.

NATURAL RESOURCES

The GIS composite resource analysis was used to guide planning of the implementation of the GMP natural resource goal of allowing natural processes to prevail.

A 75-meter management zone along both sides of the Merced River and a 50-meter zone along both sides of Tenaya Creek would be created in which most development would be removed except some pathways and bridge crossings that would allow for restoration of riparian and other habitat areas.

The historic Sugarpine and Ahwahnee Bridges on the Merced River would be redesigned and modified to allow for improved hydrological processes along this section of the Merced. The improvement would be less significant than would be expected in alternatives 2 and 3. Effects of January 1997 flood in the Lower Pines and Rivers Campgrounds were attributed in part to the inadequate capacity of these bridges to convey the full flood discharge. This allowed the excess flow to cut across river meanders and over bridge abutments. Redesign of these bridges would help to reduce the proportion of flow entering the cutoff channel and over-topping bridges and could allow a stable bank configuration to develop more quickly.

All of the campsites in the river management zone of the Merced River and Tenaya Creek would be removed and the area would be restored to mixed conifer and riparian habitat. Relocation of the campgrounds out of the floodplain would allow the Merced River to function as a meandering alluvial river occupying floodplains during high water.

CULTURAL RESOURCE MANAGEMENT

Implementation of this alternative would provide for an approach to management of cultural resources and landscapes that would be similar to the no-action alternative but would increase the understanding of the relationships between the natural and cultural environments. All cultural resources would be treated in conformance with laws, regulations, and guidelines, including the National Historic Preservation Act, the *Secretary of Interior's Standards for Rehabilitation of Historic Buildings* and the *Secretary's Guidelines for Archeology and Historic Preservation*, and the policies of NPS-28 *Cultural Resource Management Guideline* (NPS 1994).

Collections would be moved, conserved, and housed in environmentally suitable facilities out of the valley. The historic Curry orchard would be replanted with a nonfruiting variety of apple tree.

The historic Sugarpine and Ahwahnee Bridges would be redesigned and modified. Mitigative measures, including documentation, would be developed in consultation with the state historic preservation officer.

INTERPRETATION AND VISITOR SERVICES

The intent of this alternative would be to improve the visitor experience in the valley while undertaking the fewest changes possible at the least cost. The alternative emphasizes facility remodeling and renovation coupled with new and upgraded interpretation. Passive, social, and recreational activities would continue as at present. No major new visitor or interpretive facilities would be planned in the valley, but the exhibit area in the visitor center in Yosemite Village would be renovated.

The shuttle stop at the valley transfer center in the remodeled Village Store would provide limited information, orientation, and wayfinding assistance and a small interpretive sales area. Greater levels of assistance would be found at the visitor center. The path between the visitor center and the transfer center would be well marked.

Information / Orientation

Information service would be enhanced at South, Arch Rock and Big Oak Flat entrances. At South and Big Oak Flat entrances, new facilities would be constructed to provide visit planning and information services. The Arch Rock entrance station could be relocated to the boundary between the El Portal administrative area and the park. Limited nearby parking would be provided. The facilities would be staffed. Visual displays would suggest park themes and available experiences. Free park maps and folders would be provided, and current information regarding conditions, events, and safety would be available. Emphasis would be on quick, responsive and effective service. Separate planning and design compliance would take place for these projects.

The shuttle stop at the valley transfer center in the Village Store would provide orientation and wayfinding assistance. Staff would provide help with special questions or needs. Shuttle buses would be supplied with system maps and timetables. Stops would be clearly marked and would provide direction to nearby features and events. Campground check-in locations would have information services at nearby kiosks.

Interpretation / Education

Renovations at the visitor center would include revision and upgrading of its spaces and development of new exhibits and audiovisual programs. The bookstore would remain, and an entry information desk would continue to provide visitor services. The new exhibits would present parkwide themes. An orientation film would continue to be shown in one of the two renovated auditoriums. The auditoriums would continue to be used as venues for meetings, special events, and the Yosemite Theater.

The Indian Village of Ahwahnee behind the Yosemite museum would be upgraded, as would landscaping in the cemetery. The nature center at Happy Isles would be improved for expanded natural history programs and activities specifically targeted for families and educational groups. Most other interpretive developments, trails, wayside signs, and amphitheaters would be retained in their present locations, but with renovation and upgrading.

The library, archives, and some museum collections would be partially housed on the second floor of the rehabilitated administration building (archive) and Yosemite museum (library). Museum collections would move to a building outside the valley that would meet all museum standards. All facilities would have public use areas.

Recreation

Auto touring would no longer be a passive recreational activity in the valley. The valley floor tour would operate, and sightseeing from the shuttle buses would be available. Bus touring would be improved by reduced traffic congestion and could be made shorter by improved traffic flow made possible by the reduced number of vehicles on valley roads.

Although fewer campsites would be available, campers would be able to choose among three different types of camping: RV, auto/tent, and walk-in/tent. In the east end of the valley the first tier of campgrounds would be available to all three types of campers. The second tier would be designed for auto/tent campers, although walk-in camping would be allowed. The third tier would be made up entirely of walk-in sites. Each tier would be separated by a stream channel. This arrangement would allow for a variety of experiences and degrees of quiet. The new group campground would be sited on a resilient site across the shuttle road from Upper Pines, with easy access to the Happy Isles fen and Glacier Point apron and adjacent to steep talus and scree slopes. Where feasible, campsite densities would be reduced by design and revegetation.

Bicycle touring would continue as it is now, on routes shared with buses, horses, and pedestrians. Bicycle rentals would be available at Yosemite Lodge, the Village Store, and Curry Village. All other active recreational pursuits would continue to be available in the valley.

DEVELOPMENT

Developed areas and facilities in Yosemite Valley, including lodging, retail and food services, interpretive facilities, limited maintenance support facilities, and employee housing would be retained as prescribed under previous plans. NPS and concession administrative facilities, major maintenance functions, and noncritical employee housing would eventually be removed from the valley.

Both day users and overnight guests would continue to travel to the park in their own vehicles, by tour bus, or by out-of-park transit vehicles. Vehicle circulation in Yosemite Valley would continue as in alternative 1 with use of the Northside and Southside Drive one-way loop and all valley roads and bridges.

Parking for 1,800 day use vehicles, 120 backpacker permit vehicles, and 20 day tour buses would be provided in the valley, primarily at the Curry orchard parking area, Village Store area, and Camp Six. Parking for 1,778 overnight guest vehicles would remain at lodging and campground areas, including 440 overnight spaces at Yosemite Lodge and 80 spaces at Sunnyside Campground. There would be 40 overnight bus spaces.

YOSEMITE VILLAGE

Implementation Concept

Yosemite Village would be retained as the park's primary visitor information, orientation, and interpretation location. As prescribed in the

General Management Plan, most NPS and primary concessioner administrative and maintenance functions would eventually be relocated outside the park. Essential maintenance, protection, enforcement, and warehouse/recycling activities and the concessioner's shuttle bus servicing would remain in Yosemite Village.

Food and Retail Services

The remodeled Village Store would continue to sell gifts, clothing, and groceries. The Village Grill and the Degnan's building, which houses a deli, restaurant, grill, and retail gift sales, would remain unchanged. ATM and transportation kiosk functions would be retained.

A service station would be developed adjacent to the Village Store. This assumes that visitor vehicles would continue to be a major presence in the valley.

Circulation and Parking

All roads would be accessible in Yosemite Village, although visitors would be required to park their cars and use the shuttle system. The village would continue to be accessed by the two-way road from Sentinel Bridge and Yosemite Lodge and by one-way traffic via Stoneman Bridge from Curry Village. Circulation for residents in the Yosemite Village residential areas would be unchanged.

The valley shuttle system would continue to provide free shuttle service to all east valley destinations and would continue to stop at the Village Store, Degnan's, and the visitor center and history museum. The Village Store parking area would be redesigned to serve as a major shuttle and transit facility for valley shuttles, tour buses, and out-of-park transit vehicles.

Parking for 1,483 day use visitor vehicles would continue to be provided at Camp Six and the Village Store.

AHWAHNEE HOTEL

Implementation Concept

The Ahwahnee Hotel would continue to serve as a major visitor lodging and destination area. Arrival, parking, and circulation patterns would be improved through redesign.

Circulation and Parking

The Ahwahnee Meadow road would be retained as a one-way circulation route from campgrounds and Curry Village. The Ahwahnee Hotel road would remain as the primary access for overnight guests and valley shuttles. The shuttle bus stop for the hotel would be retained. Parking spaces for overnight hotel guests, cottage guests, and staff (132 spaces) would be provided at the Ahwahnee Hotel.

VALLEY CAMPGROUNDS

Implementation Concept

The valley campgrounds and nature center at Happy Isles would be retained as visitor destination areas although some campground locations would be changed. Campsites would be relocated and reduced from 756 to 662 because of severe flood damage sustained in the January 1997 flood. The concessioner stables would be removed from the valley and the area would be redesigned for replacement campsites.

Campsites and Facilities

The nature center at Happy Isles would be retained as prescribed in the *General Management Plan* and *Concession Services Plan*. River Campgrounds, most of Lower Pines Campground, and campsites in the Merced River and Tenaya Creek management zone would be removed from the floodplain and replaced in areas less prone to severe flooding. Table 8 presents the summary of campground units under alternative 4.

TABLE 8: ALTERNATIVE 4 CAMPGROUNDS SUMMARY

Number of Sites	Location
0	Lower River
0	Upper River
58	Lower Pines
162	Campsites; Upper Pines (redesign as 3 campgrounds — Upper Pines, Clarks, Happy Pines)
135	Clarks
64	Happy Pines
60	North Pines
104	Lamon orchard (add 104 sites)
30	Walk-in, Tenaya Creek (add 7 sites)
38	Walk-in, Sunnyside
11	Group, Happy Isles
662	**Total**

The campground registration function in each campground would be removed and replaced by a new single campground registration and information checkpoint on the Southside Drive access to the campgrounds.

Food and Retail Services

The Happy Isles snack stand would be reconstructed but not necessarily in the same location or configuration.

Circulation and Parking

All shuttle bus stops for the campgrounds would be retained and relocated to meet new campground configurations. The Happy Isles shuttle bus loop road would be retained as a one-way circulator for shuttle bus service to the nature center at Happy Isles and trailhead to Nevada Falls from west valley developed areas.

CURRY VILLAGE

Implementation Concept

Curry Village would continue to function as a major visitor destination, guest lodging, and day use parking area. All vehicles could access Curry Village as they do now. Facility and lodging locations, parking, and circulation patterns would be slightly modified. There would be substantial reductions in tent cabin lodging, and all seasonal employee housing tent cabin areas would be removed as prescribed in the *General Management Plan* and *Concession Services Plan.* Camp ambience and layout would be retained where appropriate.

Lodging and Facilities

The registration building adjacent to Stoneman Lodge would be retained. The Curry Village ice rink would remain.

Food and Retail Services

The pavilion convenience store would be enlarged to include a grocery store and deli. The mountain and sports shops would be combined and located at the pavilion. Bicycle and ski rental would also be combined and relocated to the ice rink area. Propane for campground users would also be available in the Curry Village area.

Circulation and Parking

Most circulation would remain unchanged. The four-way stop where Southside Drive intersects with Northside Drive and the Curry Village access road would remain in its current configuration. The Curry access road through the orchard parking area to Southside Drive at Stoneman Meadow would also be retained. The

one-way entry loop road for lodging registration and registration parking and the drive through the cabins parking area would be retained.

Parking for 317 day use vehicles and 120 backcountry permit vehicles would be retained at Curry orchard. Registration parking would remain at 33 spaces. Parking for 195 overnight tent cabin guests would be expanded to 230 south of Curry orchard, 150 overnight parking spaces would be retained for the guest cabins at the west end of Curry Village, and 35 spaces would be added north of the lot at the east end of Curry Village.

Shuttle bus stops would be retained at the Curry orchard day use parking and Curry Village registration areas. The bicycle trail route along the Southside Drive from Stoneman Bridge to the campgrounds and nature center at Happy Isles would not be changed, but minor route alignment might be required to avoid facility and road conflicts.

PARK OPERATIONS

The park and concessioner headquarters functions would remain in Yosemite Valley until they could be relocated. Minimal valley administration and concession office functions would be accommodated in existing buildings. The NPS stables would remain in its current location. Campground maintenance would be relocated to the former Curry dump. Remaining maintenance, emergency, and protection functions would be housed in smaller architecturally compatible structures along with concession shuttle servicing. The NPS vehicle fueling facility would remain in the NPS maintenance area and would be shared with the concession.

The Pacific Bell Telephone building and NPS stables and corral would remain in their current locations.

Staffing levels would be as described under "Actions Common to All Alternatives." The park's volunteer program would continue to supplement park staff, particularly in interpretive and educational activities.

DEVELOPMENT COSTS

The one-time development costs for alternative 4 would be $98,653,000 (see appendix A for a breakdown of costs for this alternative).

TABLE 9: SUMMARY OF ALTERNATIVES

	ALTERNATIVE 1 — NO ACTION	ALTERNATIVE 2 — PROPOSED ACTION	ALTERNATIVE 3	ALTERNATIVE 4 — MINIMUM REQUIREMENTS
Overview	Previously approved plans would continue to be implemented on a piecemeal basis.	Allows for a comprehensive approach for carrying out the provisions of previously approved plans; 147 acres restored, 82 acres redesigned, and 38 acres developed to accommodate relocated facilities. Day use visitors and out-of-park transit bus riders would stop at an orientation transfer facility at Taft Toe and would use shuttles to move about the valley. 21 acres would be developed in the west end of the valley.	Allows for a comprehensive approach for carrying out the provisions of previously approved plans; 143 acres would be restored, 93 acres redesigned, and 38 acres developed. Day use visitors and out-of-park transit bus riders would stop at an orientation transfer facility at Pohono Quarry and would use shuttles to move about the valley. 19 acres would be developed at Pohono Quarry in the west end of the valley.	Some comprehensive approaches to implementation of approved plans would be provided. 118 acres would be restored, 95 acres redesigned, and 36 acres developed. Allows for a lower level of redesign and change than alternatives 2 and 3. Day visitors and out-of-park transit bus riders would travel to the east end of the valley to park, then would use shuttles to move about the valley.
Natural Resource Management	Current plans would continue to be implemented.	• Create a 75-meter management zone along the Merced River • Create a 50-meter management zone along Tenaya Creek • Remove Stoneman, Ahwahnee, and Sugarpine Bridges • Remove roads through Cook's, Stoneman and Ahwahnee Meadows • Restore hydrologic processes of river and floodplain • Relocate campgrounds • Restore riparian areas, meadows, black oak woodlands and mixed conifer woodlands. • Remove Curry orchard	• Create a 75-meter management zone along the Merced River • Create a 50-meter management zone along Tenaya Creek • Remove Ahwahnee and Sugarpine Bridges • Remove roads through Stoneman and Ahwahnee Meadows • Restore hydrologic processes of river and floodplain • Relocate campgrounds • Restore riparian areas, meadows, black oak woodlands and mixed conifer woodlands. • Remove Curry orchard	• Create a 75-meter management zone along the Merced River • Create a 50-meter management zone along Tenaya Creek • Modify Sugarpine and Ahwahnee Bridges • Restore hydrologic processes of river and floodplain (except bridge effects) • Relocate campgrounds • Restore riparian areas, meadows, black oak woodlands and mixed conifer woodlands. • Retain Curry orchard as a day use parking lot.
Cultural Resource Management	Present management would continue; the museum collections and library would remain unchanged.	Allows for a comprehensive approach for restoration, rehabilitation, stabilization, relocation, demolition, and adaptive use; the museum collections and library would be housed in a new building in Yosemite Village.	Same as alternative 2; the museum collections and library would be housed in a new building outside the valley.	Same as alternative 2; the museum collections and library would be dispersed in Yosemite Valley and El Portal. Curry orchard would be replanted with nonfruiting trees.

	Alternative 1 — No Action	Alternative 2 — Proposed Action	Alternative 3	Alternative 4 — Minimum Requirements
Interpretation and Visitor Services	Interpretation and visitor services would continue as at present.	In-valley transportation modes would be revised; no private vehicle access would be provided. A new visitor orientation/ transfer station would be built at Taft Toe, and a new information/interpretation/transit facility would be provided in an adapted or reconstructed village store.	Same as alternative 2 except the new visitor orientation/transfer facility would be built at Pohono Quarry. A new visitor information/ transit station would be provided in an adapted or reconstructed village store.	Facilities would be remodeled or renovated rather than replaced. Few new facilities would be built. Costs would be minimized. A new information/transit facility would be provided in a remodeled village store.
Valley General	Previously approved plans would continue to be implemented on a piecemeal basis.	Noncritical facilities would be reduced, as would traffic and congestion. Sensitive habitat would be restored. Previously approved plans would be implemented. South side Drive would be converted to two-way traffic from Taft Toe to Curry Village. Northside Drive would be closed to vehicles from El Capitan Bridge east to Yosemite Falls and converted to one lane for bicycles, pedestrians and emergency vehicles. Outbound visitors would exit the valley via Southside Drive and over El Capitan Bridge to Northside Drive heading west.	Noncritical facilities would be reduced, as would traffic and congestion. Sensitive habitat would be restored. Previously approved plans would be implemented. Southside Drive would be converted to two-way traffic from Pohono Quarry to Curry Village. Northside Drive would be closed to vehicles from the El Capitan Bridge east to Yosemite Falls and reduced to one lane for bicycle, pedestrians and emergency vehicles. Outbound visitors would exit the valley via Southside Drive and over El Capitan Bridge to Northside Drive heading west.	Approved plans would be implemented. Circulation would not change.
Yosemite Village	Previously approved plans would continue to be implemented on a piecemeal basis.	All administrative functions would be removed. The information / interpretation / transit station would serve as the shuttle hub.	Same as alternative 2.	Most administrative and maintenance facilities would be removed from the valley. Some facilities would be adaptively reused. The information / interpretation / transit facility would serve as the shuttle hub.
Ahwahnee Hotel	Previously approved plans would continue to be implemented on a piecemeal basis.	Visitor arrival, wayfinding, and circulation would be improved. Sensitive habitat would be restored.	Same as alternative 2.	Same as alternative 2, except that there would be less restoration of habitat because the bridges would be modified rather than removed.

	Alternative 1 — No Action	Alternative 2 — Proposed Action	Alternative 3	Alternative 4 — Minimum Requirements
Campgrounds	Six campgrounds and a group camp would total 756 campsites.	Some campgrounds and associated development would be moved out of river and stream habitat and flood areas. Arrival, wayfinding, parking, and circulation would be improved. Registration would be replaced by a single checkpoint near the former Boys Town site. The former Curry dump site would be developed for campground maintenance. The recreational vehicle dump station would be relocated away from the river near the new campground checkpoint. The concessioner stables would be removed. The amphitheater at Lower Pines would be removed and replaced with new ones at Upper Pines and North Pines. There would be a total of 675 campsites.	Same as alternative 2, the former Curry dump site would be developed for campground maintenance and NPS stables, and the road configuration would be different. There would be a total of 675 campsites.	Same as alternative 2 except the dump station would remain at its current location, the new campground checkpoint would be located on the Southside Drive access to the campgrounds, and the road configuration would be unique to this alternative. There would be a total of 662 campsites.
Curry Village	Most visitors would arrive by way of Southside Drive and exit by the road through Stoneman Meadow, across Stoneman Bridge and along the road between Upper and Lower River Campgrounds. Day use parking would remain. Facility and lodging locations, parking and circulation patterns would remain generally the same.	Visitors would arrive and exit via a realigned Southside Drive. The segment of Northside Drive through Ahwahnee Meadow and the section of Southside Drive through Stoneman Meadow would be removed. Day use parking would be removed. Stoneman Lodge would be adapted as a guest registration/ administration building. The mountain and sports shops and bicycle and ski rental would be relocated to the ice rink area. The Curry Pavilion convenience store would be expanded to include grocery/ deli functions and to serve as a central camp store. The drive from Southside Drive to Huff House and the adjacent parking area would be removed. The ice rink would be reached via a new service drive off the registration loop. A new bicycle trail route through the village to the valley campgrounds and nature center at Happy Isles would replace the former one along Southside Drive.	Same as alternative 2 except that registration would remain unchanged; the ice rink would be relocated to its historic location along with the mountain and sport shops, and bicycle and ski rental; a new bicycle path would connect Yosemite Village, Curry Village and the campgrounds through the former River Campgrounds area over Stoneman Bridge; the registration parking would be redesigned to be accessed from the registration loop.	Same as alternative 1.

	Alternative 1 — No Action	Alternative 2 — Proposed Action	Alternative 3	Alternative 4 — Minimum Requirements
Park Operations	Park and concessioner headquarters functions would remain in Yosemite Valley until they could be relocated. Minimal valley administration and concessioner office functions would be accommodated in existing buildings. The Pacific Bell Telephone building and the NPS stables and corral would remain in their current locations.	Remaining maintenance, emergency, and protection functions would be housed in smaller, architecturally compatible structures. As technology allows, the Pacific Bell building would be removed or redesigned in the maintenance area or accommodated in other structures. The NPS corral and YCS stockholding area and campground maintenance would be relocated to the former Curry dump site. The NPS stable would be moved out of the valley.	Same as alternative 2.	Same as alternative 1.
Development Costs	$66,321,000	$141,862,000	$271,241,000	$98,653,000

TABLE 10: SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	ALTERNATIVE 1 — NO ACTION	ALTERNATIVE 2 — PROPOSED ACTION	ALTERNATIVE 3	ALTERNATIVE 4 — MINIMUM REQUIREMENTS
Aquatic, riparian , meadow communities (506 acres on valley floor)	185 acres remain disturbed (153 by flood-damaged infrastructure), 4 acres restored, cannot be determined how many acres of this type would be redesigned or developed	21 acres restored, 6 redesigned, 6 developed	22 acres would be restored, 6 acres redesigned and 5 developed	17 acres would be restored, 4 acres redesigned and 5 developed.
Upland communities (3144 acres on valley floor)	28 acres would be restored, 9 redesigned and 0 developed	115 acres would be restored, 64 redesigned and 49 developed	117 acres would be restored, 72 redesigned and 45 developed	95 acres would be restored, 66 acres redesigned and 26 acres developed
Rare, threatened, endangered, and sensitive plants	No known effect	No known effect	No known effect.	No known effect.
Wildlife	Development would continue to diminish habitats and associated wildlife in the east valley. Habitats and wildlife would remain relatively intact in west valley but would continue to be disturbed by traffic.	Beneficial effects in the east valley would be proportional to the size of restored habitat blocks. New development in the west valley would provide new site for wildlife/ human conflicts.	Beneficial effects in the east valley would be proportional to the size of restored habitat blocks. New development in the west valley would provide new site for wildlife/human conflicts.	There would be little benefit, as little restoration would occur. There would be no new impacts in the west end of the valley.
Merced River scenic values	Development and visitor use have caused major impacts on some sections.	Restoration of 130 acres in the scenic river corridor would enhance scenic, recreational, biological and hydrological values more than any other alternative. Reduction in the number of private vehicles would improve air quality in the corridor.	Restoration of 113 acres in the scenic river corridor would enhance scenic, recreational, biological and hydrological values more than alternatives 1 and 4. Reduction in the number of private vehicles would improve air quality in the corridor.	Restoration of 78 acres would enhance scenic, recreational, and biological values. There would be very little benefit to hydrological values. Some air pollutants might decrease slightly from the reduction in the number of private vehicles.

	Alternative 1 — No Action	Alternative 2 — Proposed Action	Alternative 3	Alternative 4 — Minimum Requirements
Hydrology	3 inadequately designed bridges and campsites too close to the river would continue to limit the ability of the river to dissipate energy during peak discharge periods	Removal of 3 bridges and relocation of development would restore natural hydrologic processes.	Removal of 2 bridges and relocation of development would restore the natural hydrology of the river but less than in alternative 2.	Slight improvements in Merced River hydrology would be made by modifying 2 bridges.
Air quality	Would continue at existing levels as visitors use their vehicles to travel to and within the valley	Reductions in automobile use would improve air quality.	Reductions in automobile use would improve air quality slightly more than in alternative 2.	Reductions in automobile use would result in fewer pollutants than alternative 1, but more than alternatives 2 and 3 except that No_x might be reduced by 2015.
Scenic quality	Greatest effect is visibility of NPS and concession maintenance and warehouse complex from Glacier Point	Restoration of 147 acres would improve scenic quality and most views.	Restoration of 143 acres would improve scenic quality and most views. Pohono facility would be readily visible from Discovery Point.	Restoration of 104 acres would minimally improve scenic quality.
Noise	Autos and buses would continue to produce near constant noise in the most heavily used visitor areas.	Major reduction. Most locations would experience more time at ambient noise levels.	Similar to alternative 2, but more noise between the transfer point and the village.	Noise would be reduced but not as much as in alternatives 2 and 3.
Archeological sites	A total of 90 sites would be directly affected by actions of approved plans or continue to degrade under existing conditions. Long term preservation would be enhanced at six sites.	80% of the sites would either be affected or would continue to degrade; preservation would be improved at three sites	Up to 23 sites would be affected.	Up to 8 sites would be directly affected. Long-term preservation would be enhanced at three sites.
Traditional cultural properties	Impacts would be avoided or mitigated through consultation with American Indian groups	No effects beyond those of alternative 1.	No effects beyond those of alternative 1.	No effects beyond those of alternative 1.

	Alternative 1 — No Action	Alternative 2 — Proposed Action	Alternative 3	Alternative 4 — Minimum Requirements
Historic sites and structures	Irretrievable loss of historic property throughout the valley as called for in the *General Management Plan* and its implementing plans. Compliance has been completed	Removal of 3 bridges and Curry Orchard would result in an irretrievable loss of historic property.	Adverse effects would result from removal of 2 bridges and reduction of Curry orchard.	Modifying two bridges would retain them in the historic scene, but cause adverse effects.
Cultural landscapes	Retention of character-defining features. Adverse effects on cultural landscapes from implementing previous plans	3 bridges, road segments, and Curry orchard would be removed, which would be an irretrievable loss.	Adverse effects would result from the removal of 2 bridges and part of Curry orchard	Effects on Curry orchard would be less than in alternative 2. Modifying the bridges would retain them, but effects would be adverse.
Museum, archive, and library collections	Collections would be maintained but would continue to be vulnerable to deterioration	Impacts would be limited to any that might occur while the collections were being moved. New facilities would be beneficial to the collections.	Rehousing would be of benefit to the collections.	Similar to no action.
Visitor use and interpretation	Continue to be diminished by overcrowding, automobile traffic, difficulty locating orientation and interpretive services and overextended visitor services	Services would be improved and crowding would be reduced. Tranquility would increase, and more enjoyment of the environment would be possible.	Services would be improved and crowding would be reduced. Tranquility would increase, and more enjoyment of the environment would be possible.	Effects would be more beneficial to visitors than alternative 1, but less than alternatives 2 and 3.
Socioeconomic	No VIP effects beyond those described in the *General Management Plan, Concession Services Plan,* and draft *Housing Plan*	There would be some short-term loss of revenue, but over the long term, spending would not be affected.	Short-term decreases in spending would be expected, but no long-term effects are predicted.	Short-term decreases in spending would be expected, but no long-term effects are predicted.

Note: The numbers of acres disturbed, restored, redesigned and developed in the communities (aquatic, riparian, meadow communities and upland communities) listed on this summary of environmental consequences table will not add up to the total acres that remain disturbed, restored, redesigned and developed in the alternatives table because there is a category called "other" (orchards, watered lawns, bare, developed open area, sparse vegetation) which does not appear in the environmental consequences summary table numbers but is included in the numbers in the summary of alternatives table. For example, in alternative 2, 21 acres of aquatic communities plus 115 acres of upland communities restored does not equal the 147 acres listed as restored in the alternatives table because there are 11 acres in the "other" category that are included in the numbers in the summary of alternatives.



AFFECTED ENVIRONMENT

REGIONAL SETTING

Yosemite National Park lies on the western slope of the Sierra Nevada range in central California between the San Joaquin Valley to the west and the Great Basin to the east. Yosemite Valley can be reached by three primary routes: (1) California State Highway 41 and Wawona Road from the south and Fresno area, (2) California State Highway 140 and El Portal Road from the west and Merced area, and (3) California State Highway 120 and Big Oak Flat Road from the northwest and from Tioga Pass in the summer. Near where these roads enter the west end of the valley, they join to form Southside Drive, a two-lane, one-way road to the east end of the valley that parallels the Merced River on its south side.

Yosemite Valley is a glacier-carved valley between 3,800 feet and 4,200 feet in elevation, oriented in an east-west direction. It is distinguished by its great depth relative to its width, exceptionally sheer walls, and a level, almost gradeless floor (Milestone 1978). Yosemite Valley is 9.5 miles long and varies from 0.5 to 1 mile in width. The nearly vertical walls of Yosemite Valley rise 1,500 to 4,000 feet above the valley floor.

The Sierra Nevada is primarily composed of a great batholith of igneous rock exposed by rapid uplift and erosion of overlying volcanic, metavolcanic, and sedimentary deposits (NPS, Botti, 1990). The present form of Yosemite Valley results from three major glaciation periods, the last of which ended 10,000–12,000 years ago. As the last glacier retreated a great lake created by riverine and glacial processes filled the valley. Fed by Tenaya and Tioga stage glaciers, the Merced River filled in the ancient lake basin with glacial outwash (USGS 1930). Three layers of lake fill were found in Yosemite Valley (Gutenberg et al. 1956), the greatest total thickness measuring over 1,900 feet. The Merced River has eroded into the lake sediments to produce a floodplain averaging 0.25-mile wide.

Yosemite Valley has cool, moist winters and warm, dry summers. Precipitation is scarce between May and September and averages 37 inches yearly. The snow season in Yosemite Valley is from November through March, but snow rarely accumulates to more that 2 feet deep. The valley floor, especially the sunny north side, is often free of snow for long periods. Average temperatures in Yosemite Valley range from 25°F–89°F.

Soils in Yosemite are derived from the decomposition of granitic bedrock. Detailed soil maps have been compiled for Yosemite Valley (Soils Conservation Service 1992). The *General Management Plan* identified areas with use limitations based on the presence of poorly drained soils, severe slopes, shallow soil depth, and fragile vegetation.

ECOSYSTEM PROCESSES

The dominant ecosystem processes affecting the evolution of all the major plant communities of Yosemite Valley are Merced River hydrology, rockfall, shifting temperatures and sun exposure, fire, and human activities.

Hydrology

Broad flat valleys such as Yosemite Valley are associated with meandering low velocity streams characterized by seasonal overbank flooding. Seasonal flooding and the slow movement of the Merced River channel across Yosemite Valley has resulted in stream bars, levees, low-lying wetlands, wet meadows, and other landforms that are important determinants of the plant and animal communities on the valley floor.

Flood pulses play key roles in the maintenance of aquatic populations, communities, and ecosystem processes of Yosemite Valley. Seasonal flooding is a regular event and is not considered a disturbance to natural communities unless it is amplified, reduced, or mistimed outside of the long-term pattern. Lateral exchange between the floodplain and river channel and nutrient recycling in the floodplain are important. Large floods contribute to the ecosystem by resetting late successional stages to early stages, which increases habitat and species diversity. Aquatic habitats appear and disappear with rising and falling rivers. Nutrients and resources transfer between aquatic and terrestrial environments with the movement of water (Junk et al. 1989). Long-lived plant communities such as established forests develop over time in relation to the cycle of floods and droughts (Bailey 1996).

Exceptionally severe winter floods seem to recur every 5 to 30 years, when early winter, warm, tropical storms produce heavy rain on the high-elevation snowpack. These forceful events reshape the floor of Yosemite Valley and may cause significant losses to human property and park infrastructure.

The expansion and contraction caused by alternating freezing and thawing of water in the cracks of Yosemite's cliffs weaken its structure and result in periodic rockfall. This rockfall has created steep talus slopes along each side of the valley that provide better drained soils and warmer microhabitats than are found on the adjacent valley floor and crevices and caves that are home to many animal species. Continued rockfall affects the growth form of many individual plants, keeps large areas in the early stages of succession, and creates a hazard zone that threatens human structures and activities.

Light and Temperature Regimes

Because of its east-west orientation, the south side of the valley tends to be shadier, cooler, and wetter that the sunny, warm, north side of the valley, especially in winter. The differences in light, temperature, and moisture have had a significant effect on the plant communities that have developed along the two sides of Yosemite Valley. Light and temperature also influence human activity; the warmer, often snow-free, sunny side is favored in winter, while the cooler, south side is preferred during the hot summer months.

Fire

All major plant communities in Yosemite Valley evolved under the influence of fire, and many plants have adapted to frequent fires.

The natural fire regime in Yosemite Valley was probably characterized by infrequent moderate-to-high intensity fires that entered from the west and burned large areas in a short time. A dense mixed conifer forest would probably have evolved under a lightning-ignited fire regime with some differentiating characteristics between

the wetter south and drier north sides of the valley.

Human Activities

Yosemite has been a site of American Indian settlement and activity for at least 4,000 years, possibly as long as 6,000 years. Historical records indicate that, since human settlement, frequent Indian fires may have been a more dominant influence on vegetative communities than lightning fires in Yosemite Valley (Anderson and Carpenter 1991). The Indian fire regime would have significantly altered the mixed-conifer vegetation typical of lower elevations with lightning fires.

Current management objectives call for restoring processes (primarily through prescribed burning) that simulate the effects of Indian fire in recognition of the long-time influence of Indian burning in shaping the landscape of Yosemite Valley. Mechanical clearing is also prescribed to reduce fuel loads and the threat of major wildfire. Specific prescriptions for target communities are guided by analysis of historic conditions as well as recent and ongoing studies on vegetative changes.

Numerous human-caused changes have been made to the surface topography of Yosemite Valley in the past 190 years, including river channelization, constriction of natural sheet flows, and the lowering (by blasting) of the terminal moraine in the 1890s, which has lowered the valley's water table and allowed the river to cut deeper, which caused an associated drying of adjacent meadows and wetlands.

The degree to which American Indian burning and human-caused hydrological changes have affected the vegetation in Yosemite Valley has not been fully determined. The rate of forest encroachment into meadows far exceeds natural rates of succession, and the effective functioning of the Merced River ecosystem is dependent on the maintenance of natural riverine processes, including links between the Merced River channel and its floodplain.

VEGETATION

Yosemite National Park supports five major biotic zones: chaparral/oak woodland, mixed conifer, montane, subalpine, and alpine. Yosemite Valley is in the mixed conifer zone. Forty-one vegetative types have been identified in Yosemite Valley in this zone (Acree 1994). These vegetative types may be grouped loosely into upland, riparian, meadow, and aquatic communities.

Upland Plant Communities

Five forest types are primary. On the floor of the valley are California black oak woodland and mixed coniferous forest (comprising the six mixed-conifer communities). On the talus slopes along the sides of the valley are canyon live oak forest, north-facing mixed conifer/canyon live oak talus forest, and south-facing mixed conifer/canyon live oak talus forest. A sixth type, characterized by steep granite cliffs and many discrete microhabitats, is the cliff community.

Annosus root disease is a native fungal infection that attacks the roots of conifers. A particular strain in Yosemite Valley that infects ponderosa pine and incense-cedar has spread widely with the encroachment of these species into wet areas and meadows adjacent to the Merced River. Also, the spread of Annosus has been unnaturally stimulated by the cutting of hazard trees, which leaves stumps that provide an avenue for infection. There are several centers of significant Annosus infestation in Yosemite Valley. Conifers in permanently damp areas near the river are susceptible to Annosus infection.

Two specific areas in which development is proposed are Taft Toe and the Pohono quarry. Taft Toe is characterized by the moist mixed-conifer subvegetation type, Pohono Quarry by the dry subtype.

Pohono Quarry is in a multiaged mixed-conifer community. It lies adjacent to a steep talus slope with a canyon live oak community. It contains a

high proportion of California black oak and many areas of dense young ponderosa pines that are encroaching on older oaks and pines.

California black oaks in Yosemite Valley form pure open stands of large stately trees with a herbaceous understory. Dense stands of California black oak also grow on talus slopes near drainages. The black oak acorn was the primary food of Indians in Yosemite Valley. The acorn is still gathered and used, and most of the large groves are considered traditional gathering areas.

California black oak communities in Yosemite Valley are identified as sensitive due to declines in population size, vigor, and recruitment rates. Changes in natural or cultural fire processes, encroachment by conifers, browsing by deer and rodents, and impacts from development and unmanaged visitor use have caused a significant decline in density and stand structure (NPS, Fritzke, 1996). Irrigation of California black oaks in landscaped areas contributes to the spread of fungal diseases.

Yosemite Valley stands of California black oak have been reduced in historic times to about 10% of their original extent based on comparisons with historic photographs. Today, 126 acres of California black oak woodland are found in Yosemite Valley. Additional stands, mixed with ponderosa pine, total 263 acres. Black oak woodlands with development (such as buildings) total 11 acres or 0.2% of the valley floor.

The canyon live oak community grows on both north- and south-facing talus slopes in Yosemite Valley. It often forms pure or almost pure stands and covers 817 acres, or 17% of the valley floor. Fires in this community are infrequent but intense, with a fire return interval of 20 to 50 years on south-facing slopes. Most trees and shrubs in this community are adapted to crownsprout after fires.

Riparian, Aquatic, and Meadow Plant Communities

Hydrologically controlled communities in Yosemite Valley fall into three main categories: (1) the riparian zone along the edges of the Merced River channel and its tributaries, (2) aquatic systems such as the Merced River main channel, and (3) low elevation meadows on the Merced River floodplain. A substantial portion of these areas have been classified as wetlands (USFWS 1995) if three essential characteristics are present: hydric soils, hydrophilic (water-loving) vegetation, and wetland hydrology. The maintenance of riparian, aquatic, and meadow communities depends on sustaining Merced River processes, including the frequency, duration, and magnitude of flooding.

Riparian zones extend outward from the Merced River border and its tributaries into the canopy of riverside vegetation. These communities have high biological productivity. They provide specialized habitat and important nutrients. Decomposing vegetation from wetland communities provides the basis for important food chains and nutrient cycling in aquatic ecosystems. For example, leaves dropped into the river support a complex succession of microorganisms and invertebrates involved in their decomposition. Riparian zones also moderate riverine microclimates by influencing light, temperature, and shade.

Riparian zones in Yosemite Valley are characterized by broadleaf deciduous trees such as white alder and black cottonwood. Vegetation along moving water is regularly disturbed by the deposition and removal of soil and the force of floodwaters. Vegetation in this zone colonizes readily.

Bigleaf maple riparian forests grow on moist gravelly soils in protected spots at the base of cliffs and on alluvial soils bordering streams. They are dominated by bigleaf maple, white alder, white fir, and mountain dogwood. This community covers 1.4% of the valley, or 64 acres.

Riparian communities are among the most productive, sensitive, and biologically diverse in Yosemite Valley. They are also among the most impacted due to their proximity to water and the effects of trampling. The Park Service has initiated an ecological restoration program designed to protect fragile riparian riverbanks from erosion. Visitor use is directed to areas that can accommodate heavy use without long-term impact.

Aquatic habitats in main channels usually lack vascular plants because of deep water and fast currents. Algae concentrations are typically low. Channel borders are more likely to support submersed and emergent vascular aquatic plants because water is shallower and currents are slower. Production of algae is likely to be higher in low flow, low turbidity environments.

Large woody debris (over 10 feet long and 6 inches wide) plays an important role in aquatic and riparian communities. It can influence physical attributes such as pool formation, river profile, and channel pattern and position and provides habitat, cover, and nutrients.

The meadows in Yosemite Valley are transition zones that are sometimes wet and sometimes dry. They link the Merced River and its tributaries to permanently dry land. The aquatic food chain in the Merced River is dependent on a connection with overflow channels in the meadows, which spill over during periods of high water, releasing concentrated food sources into the river.

In Yosemite Valley meadows, vegetation is classified into three general types: (1) wet meadow, dominated by native hydrophilic vegetation, (2) grass meadow, dominated by exotic grasses (introduced in turn-of-the-century agriculture), and (3) native hydrophilic forbs (Acree 1994).

Meadow acreage in Yosemite Valley has substantially diminished since the mid-1800s. Yosemite Valley sustained 745 acres of meadow in 1866, as mapped by State Geologist J.D. Whitney. Today, the total is 65 acres, or only 6.8% of the 1866 figure (Acree 1994) due to a conversion of meadow to coniferous forest. The conversion has taken place over an unnaturally short time. A change in the prehistoric fire frequency maintained by American Indians and more recent manipulations of hydrological patterns appear to be two contributing factors to the loss of meadows.

Exotic Plants

Exotic species are those that grow in Yosemite as a result of deliberate or accidental introduction and are not part of the naturally evolved community. Approximately 150 species have been identified in Yosemite Valley to date (Randall 1992). Many of these are the last vestiges of historic orchards or ornamental plantings.

Exotic species have various effects on natural communities based on their ability to outcompete. Many species are adapted to disturbed soils and are commonly found along roads and trails. These disturbance-adapted exotic species, such as Jerusalem oak, sweet white clover, and yellow star thistle may have been brought in with construction fill or horse feed.

Several exotic species have established in low elevation meadow and forest communities. Exotic grasses, planted in low elevation meadows at the turn of the century for agricultural purposes, remain the dominant species in most Yosemite Valley meadows. Bull thistle and Himalayan blackberries are other examples of exotic species that have proven their ability to invade and outcompete native vegetation. Control and preventive efforts are underway for many of these key species.

WILDLIFE

Little is known about the status, distribution, and population trends of the park's wildlife. Descriptions of park animals and evaluations of possible impacts are based primarily on the professional knowledge and judgment of park

staff, wildlife/habitat relationship models (Chow et al., 1994), records of observations, and limited studies of selected species. Specific studies would be necessary to identify and mitigate impacts as various parts of this plan are implemented.

The abundance, distribution, and diversity of wildlife are dependent on the type and quality of habitat. Any degradation or restoration of these communities would have impacts on wildlife. The costs or benefits to habitat are also influenced by the size of the affected area and its proximity to development. Large mammals such as mountain lions, black bears, and mule deer require large home ranges and benefit less from restoration of small habitat blocks than do smaller animals such as rodents, birds, and invertebrates.

Mammals. Approximately 46 native mammal species in five families inhabit Yosemite Valley. The insectivore family includes five shrews and one mole. There are 16 species of bat, nine of which are considered species of special concern by the state of California, and four of which are former federal category 2 species (see table 11). Carnivores include bears, bobcats, coyotes, raccoons, weasels, and gray foxes. There are 5 species of squirrel, 3 species of chipmunks, 7 species of mice, and several other species of rodents, including wood rats, voles, gophers, and porcupines.

The heavy visitation to Yosemite Valley and its relatively high number of resident employees have led to many human/wildlife conflicts. The root of most of these problems is the availability of human food. Improperly stored food and garbage and deliberate feeding alter the natural behavior of wildlife and lead to property damage and threats to human safety. In 1996 over $250,000 in property damage was caused by black bears in Yosemite Valley. The park's wildlife management staff spends most of its time dealing with human/wildlife conflicts. Any new areas of human use in Yosemite Valley would provide new sources of human food for wildlife and would cause corresponding human/wildlife conflicts unless comprehensive mitigation measures (e.g., enforcement of regulations, visitor information, and food storage facilities) are pursued.

In recent years, sightings of mountain lions in Yosemite Valley have increased. These sightings, coupled with two human fatalities in California from mountain lion attacks in 1994, have caused concern. Lions are attracted to developed areas by unnaturally high prey populations that are supported by human food sources. Further reduction of lion habitat from development or expanded human presence could impact lion populations and increase the chance of encounters.

Birds. Many bird species are found in or near the park; 224 species have been recorded in the Yosemite region, 36 of which are infrequently recorded (Stebbins 1974). Most of these species begin to migrate south or to lower elevations in the late summer and fall. The diversity of habitats and the relatively low elevation of Yosemite Valley support a variety of birds, but of 84 species that are known to nest in Yosemite Valley, 54% are rare or absent in the winter.

Several bird species have probably been reduced in Yosemite Valley by human activity. Valley meadows were suitable habitat for great gray owls, but sightings of this species in Yosemite Valley are rare. Numbers of willow flycatchers appear to have diminished due to destruction of riparian habitat and nest parasitism by brown-headed cowbirds. Harlequin ducks were never common in Yosemite Valley, but there are no recent records of this species.

Reptiles and Amphibians. Compared to most mountain regions of the West, Yosemite has a particularly large number of native reptiles and amphibians: 14 snakes (one poisonous), 7 lizards, 1 turtle, 2 toads, 1 tree frog, 3 frogs, and 5 salamanders (including newt and ensatina). Most of these species have been found in Yosemite Valley.

Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost & Fellers 1996).

The three species of true frogs (*Ranidae*) once found in Yosemite Valley are now apparently extinct there. These species included foothill yellow frog, mountain yellow-legged frog, and red-legged frog. A significant factor in their disappearance was probably predation by bullfrogs, a nonnative species found throughout Yosemite Valley.

Fish. Most fish in Yosemite were introduced. Prior to trout stocking for sport fishing, the native fish were restricted in both range and number of species. The last period of glaciation eliminated all fish from the high country. The waterfalls remaining on all the rivers after the glaciers retreated prevented repopulation by upstream migration. Only the lower drainage systems of the Tuolumne and Merced Rivers were populated with fish when Europeans first arrived. The rainbow trout and Sacramento sucker were abundant, while the Sacramento squawfish, hardhead, California roach, and riffle sculpin were less common.

Severe climatic conditions, low nutrient availability associated with snow melt and granitic watersheds, and lack of spawning habitat have prevented the survival of planted fish in a majority of Yosemite's lakes. According to fishery surveys conducted in the mid-1970s, 62 of the lakes have self-supporting fish populations and 195 support little or no natural reproduction. Approximately 550 miles of streams are thought to support fish (NPS, Botti, 1977).

Beginning in 1978, a change in park policy was implemented that ended almost 100 years of fish stocking in Yosemite by 1991. A contemporary fisheries program, consistent with natural area management policies, is being planned by the park's natural resources managers.

Human activity has undoubtedly altered fish populations and habitat in Yosemite Valley. Nonnative brown trout now outnumber rainbow trout in many stretches of the Merced River, and introductions of nonnative rainbow trout have altered the genetics of Yosemite Valley's native strain.

Until very recently, trees that fell into the Merced River were considered hazardous to bridges and humans and were removed. This deprived fish and other aquatic organisms of important habitat and has altered natural river dynamics. Fallen trees are now allowed to remain in the river because of their value to aquatic and riparian ecosystems.

Elimination of riparian vegetation by human trampling in many areas along the Merced River has reduced nutrients (fallen leaves) in aquatic ecosystems, which has affected the food chain. The loss of soil from riverbanks caused by the lack of riparian vegetation has also led to the creation of broad, shallow stretches of the river that support few fish (California Department of Fish and Game 1990, Kisanuki and Shaw 1992).

Exotic Wildlife Species. Nonnative wildlife includes several species of trout, white-tailed ptarmigan, wild turkey, and the bullfrog. Feral pigs have recently been sighted near the park and could establish ranges in park ecosystems. All of these species probably have some detrimental effect on native wildlife.

Rainbow trout are native to the Merced River and its tributaries in Yosemite Valley. Brown trout and nonnative strains of rainbow trout were planted, which has altered the aquatic ecosystem. Recent changes in fishing regulations that restrict the take of rainbow trout in the Merced River are aimed at restoring a more natural population.

The sensitive balance of aquatic ecosystems in Yosemite Valley has been severely disrupted by the presence of bullfrogs, which are voracious nonnative predators. The full impact of bullfrogs on native species in the park is unknown, but studies in other areas of California have determined that a wide variety of animals are preyed upon, including insects, fish, other amphibians, birds, reptiles, and small mammals. Bullfrog predation was probably a factor in the disappearance of red-legged frogs, foothill yellow-legged frogs, and mountain yellow-legged frogs from Yosemite Valley. The time of introduction of bullfrogs is unknown, but recent

observations suggest that they currently occupy standing and slow-moving water throughout the valley.

Brown-headed cowbirds have increased in the Sierra Nevada. Cowbirds are nest parasites that lay their eggs in the nests of other birds, usually songbirds. The cowbird eggs hatch before the eggs of the host species, and the larger, more vigorous cowbird chicks then eject the eggs or young of the host species or outcompete the host's young for food. This parasitism has been shown to have devastating effects on songbird populations. Currently, brown-headed cowbirds are common in Yosemite and can be found in large numbers around the park's stables and corrals, campgrounds, and residential areas. A 1995–1996 study found relatively low rates of parasitism but also found evidence that it may increase (Lamon and Halterman 1997).

Threatened, Endangered, and Rare Species. Environmental extremes and geographic isolation have encouraged speciation and have allowed relic species and communities to survive.

While none of the state-protected or former category 2 species are found in Yosemite Valley, four of the 49 park-listed rare species grow in the valley. Sierra laurel (*Leucothoe davisiae*) grows in wet areas and bogs in acid soil in four small populations near Mirror Lake. False pimpernel (*Lindernia dubia var. anagallidea*) lives in wet meadows. *Phacelia tanacetifolia* grows in a sandy, open area near the base of Bridalveil Fall. Ladies tresses orchid (*Spiranthes porrifolia*) is found in wet meadows near Mirror Lake and Sentinel Meadow.

Table 11 presents federally listed threatened or endangered species, species of concern (former federal category 2 species), state-listed threatened, endangered, and rare species; and species that are locally rare or threatened that are known to be or could be in Yosemite Valley.

TABLE 11: THREATENED, ENDANGERED, AND RARE SPECIES

Species	Status[2]			Habitat Type/Occurrence
	USFWS	State	Park	
BIRDS				
Harlequin duck (*Histrionicus histrionicus)*	FSC	CSC		No recent records in Yosemite Valley, but past history of breeding. Swift-flowing streams.
Bald eagle *Haliaeetus leucocephalus*	FT	CT		Forages over rivers, streams, and lakes, primarily for fish. Usually nests on high cliffs near water. Rarely observed in Yosemite Valley.
Sharp-shinned hawk *Accipiter striatus*		CSC		Hunts in open coniferous forests and edges of meadows and clearings. Nests in forests. One old (1930) record of nesting in Yosemite Valley.
Cooper's hawk *Accipiter cooperii*		CSC		Found in various habitats. Prefer live oak for nesting. Hunts in and over forests.
Northern goshawk *Accipitor gentilis*	FSC	CSC		Found in coniferous forests. Rare in Yosemite Valley; no known nesting. Year-round resident in the Sierra.
Golden eagle *Aquila chrysaetos*		CSC		Hunts in open country, nests on rocky ledges. Has nested on cliffs above the valley; no recent records.
Peregrine falcon *Falco peregrinus anatum*	FE	CE		Hunts for prey along high cliffs and forages over meadows and forests, diving on prey from above. Nests on high cliff ledges. Active nest sites: Rhombus Wall, Illilouette Canyon, Cathedral Rocks.
Prairie falcon *Falco mexicanus*		CSC		Hunts in open country. Nests on rocky ledges. Rarely seen in Yosemite Valley; no known nesting.

Species	Status[2]			Habitat Type/Occurrence
	USFWS	State	Park	
Mountain quail *Oreortyx pictus*	FSC			Rare breeder and migrant in the valley. Inhabits brushy steep slopes, wooded edges of meadows and clearings.
California spotted owl *Strix occidentalis occidentalis*	FSC	CSC		Breeds primarily in old-growth mixed conifer and oak-woodland habitat. Confirmed nest sites near Happy Isles, Mirror Lake, and the Chapel.
Great gray owl *Strix nebulosa*	FSC	CE		Breeds in mixed conifer/red fir forests bordering meadows. Winters in mixed conifer down to blue oak woodland. No regular use in the valley, though suitable habitat exists.
Long-eared owl *Asio otus*		CSC		Nest in riparian forests and oak/conifer woodlands. One nesting record in Yosemite Valley in 1915.
Willow flycatcher *Empidonax traillii*		CE		Breeds in mountain meadows and riparian area with willow thickets and standing or running water. Apparently no longer nests in the valley; last sighting was in 1966.
MAMMALS				
Pallid bat *Antrozous pallidus*	FSC	CSC		Roosts in trees, caves, mines, buildings, and bridges. Forages in wide variety of habitats, catching ground-dwelling arthropods. Captured in Yosemite Valley in 1993 and 1995. Known roost site at Ahwahnee Hotel.
Spotted bat *Euderma maculatum*	FSC			Rare throughout range. Roosts in rock crevices on cliff faces. One known roost in the valley; more are probable. Forages in wide variety of habitats.
Long-eared myotis bat *Myotis evotis*				Found in coniferous and mixed forests. Most abundant species in giant sequoia habitats. Roosts in hollow trees, under peeling bark, in rock crevices, mines, caves, and buildings. Captured in Yosemite Valley in 1993.
Small-footed myotis bat *Myotis ciliolabrum*	FSC			Usually found above 6,000-foot elevation and in deserts. Roosts in mines, caves, buildings, rock crevices, hollow trees, and under peeling bark.
Fringed myotis bat *Myotis thysanodes*	FSC			Roosts in trees, caves, mines, rock crevices, and buildings. Habitat spans wide a range from deserts to coniferous forests. Captured at two locations in Yosemite Valley in 1993.
Long-legged myotis bat *Myotis volans*	FSC			Wide range from coast to high Sierra; montane oak woodlands. Roosts primarily in hollow trees, especially large snags or lightning scarred live trees. Captured in Yosemite Valley in 1993.
Yuma myotis bat *Myotis yumanensis*	FSC			Found at low to mid elevations in urban areas, heavily forested areas, and around lakes and reservoirs. Commonly roosts in buildings but also uses trees, mines, caves, bridges, and rock crevices. Numerous captures in Yosemite Valley in 1993.
Western mastiff bat *Eumops perotis californicus*	FSC			Largest bat in North America. Roosts in rock crevices on cliffs. Forages in wide variety of habitats. Known to migrate nightly from Yosemite Valley to forage at higher and lower elevations. Two identified roost sites in Yosemite Valley; more are probable.
Townsend's big-eared bat *Plecotus townsendii*	FSC			Roosts in caves, mines, and buildings. Forages in wide variety of habitats. Captured in Yosemite Valley 1993.

Species	Status[2]			Habitat Type/Occurrence
	USFWS	State	Park	
Sierra Nevada red fox *Vulpes vulpes necator*	FSC	CT		Primarily found in red fir, lodgepole pine, subalpine forests, and alpine fell-fields. Found mostly above 7,000 feet and rarely below 5,000 feet. Five unconfirmed records for the valley. Can be easily confused with the nonnative eastern red fox.
AMPHIBIANS				
Mount Lyell salamander *Hydromantes playcephalus*	FSC			Habitat of rock fissures, seeps, shade, and low-growing plants. Records in Yosemite Valley at base of Cathedral Rocks and base of Bridalveil Falls.
California red-legged frog *Rana aurora draytonii*	FT	CSC		Found in quiet pools in permanent streams in mixed conifer and foothills. Prefers riparian deciduous habitat. Park museum specimens are from one lake at 6,000 feet.
Foothill yellow-legged frog *Rana boylei*			PR	Found in permanent streams and mountain meadows from 100 feet to 6,000 feet. Number of park museum specimens from the valley.
Mountain yellow-legged frog *Rana muscosa*			PR	Found in permanent streams, rivers, ponds, and lakes from 4,000 feet to 13,000 feet, primarily in riparian deciduous and alpine meadow habitat. Number of park museum specimens from the valley.
INVERTEBRATES				
Indian Yosemite snail *Monadenia hillebrandi yosemitensis*	FSC			Rockslides may be necessary for shelter. Record near Camp Curry in the valley.
PLANTS				
Sierra bolander *Bolandra californica*			PR	Talus slopes in crevices and on wet slopes. Many small populations between Happy Isles and Curry Village.
Mountain lady's slipper orchid *Cyrpridium montanum*			PR	Bogs and springs near Pohono Bridge.
Stream orchid *Epipactis gigantea*			PR	Seeps and bogs near Royal Arch Cascade.
Hulsea *Hulsea heterochroma*			PR	Open sandy sites near Indian caves — possible type locality.
Sierra laurel *Leucothoe davisiae*			PR	Wet areas and bogs in acid soil. Four small populations near Mirror Lake.
False pimpernel *Lindernia dubia var. anagallidea*			PR	Wet meadows near Mirror Lake and in Sentinel Meadow.
Phacelia *Phacelia tanacetifolia*			PR	Sandy, open area near the base of Bridalveil Falls.
Ladies tresses orchid *Spiranthes porrifolia*			PR	Wet meadows near Mirror Lake and Sentinel Meadow.

FSC = federal species of concern (formerly federal category 2), FE = federally endangered, FT = federally threatened, CE = California endangered, CT = California threatened, CSC = California species of special concern, R = California rare, PR = Yosemite park rare

WATER RESOURCES

Hydrology

Yosemite has a variety of surface water features; some are spectacular and a major focus for visitors. Yosemite has some of the tallest waterfalls in the world, including Yosemite Falls (with a total drop of 2,425 feet) and Ribbon Falls (1,612 feet). The park has approximately 1,591 lakes that each cover at least .018 acres and (of those) 526 cover more than 1 acre. There are three small glaciers in the high country of the park. Two major river systems originate along the Sierra Crest in Yosemite, eventually carving river canyons 3,000–4,000 feet deep. The Tuolumne River begins at the Mount Lyell glacier and drains the entire northern portion of the park, 668 square miles. The Merced River watershed begins in the park's southern peaks, primarily in the Clark and Cathedral Ranges, and drains 410 square miles. Principal tributaries of the Merced include Tenaya Creek, Yosemite Creek, and Bridalveil Creek. Hydrologic processes, including glaciation, lake-to-meadow succession, and fluvial geomorphic response, have been fundamental to the evolution of landforms in the park.

Average annual precipitation in Yosemite Valley is 36.5 inches. Flows from snowmelt peak in May and June; minimum flows are in September and October. Between October and April, snow accounts for approximately 95% of precipitation. Approximately 40% of annual precipitation is lost to evaporation.

The Merced River flows from the High Sierra through Yosemite Valley and down to the central valley of California. Its watershed is almost entirely within the park boundaries. The largest floods in the Merced River happen during extreme winter storms when warm rain falls on high elevation snowpack. Historic discharge in the river has ranged from a high of about 25,000 cubic feet per second (cfs) to a low of less than 10 cfs. The mean daily discharge is about 600 cfs.

Glaciation carved a wide, U-shaped valley down to approximately the location of Pohono Bridge. Following glacial retreat, a large lake (Lake Yosemite) developed and eventually filled with sediment from El Capitan Moraine upstream nearly to Happy Isles. This lacustrine surface has a very mild slope and is responsible for the meandering pattern of the present-day river. In this area, the Merced is an alluvial river — the bed and banks of the channel are comprised of the same materials that are carried by the river as suspended and bed load. This condition makes for dynamic channel conditions as the river alters its course periodically by eroding and depositing bed and bank materials. Floodplains are well developed along this reach.

Recharge of meadow aquifers in Yosemite Valley peaks during spring snowmelt. Groundwater and surface water function as one unit. The entire meadow system may be saturated to the forest edge, thus restricting tree growth and delimiting the forest/meadow boundary.

Floodplains

Flooding along the Merced River in Yosemite varies according to the characteristics of the various river reaches. In the mild-gradient central reach, large areas are inundated with deep, slow moving water. This type of flooding is caused by the combined effects of the valley constriction at El Capitan Moraine and low valley slope upstream. Upstream, river and overbank flooding is characterized by shallower depths and greater velocities, which results in more erosion than below and more potential for significant changes to the channel and floodplain. In the steep lower reaches, flow velocities during floods are very high, and there is enormous erosive power. However, the channel has generally adjusted to these conditions, and there is little geomorphic response during flooding. Where roads and other developments are within reach of flood waters, the effects can be devastating.

The Merced River has had 11 significant winter floods since 1916. The largest of these, in 1937,

1950, 1955, and 1997, all exceeded 22,000 cfs at the Pohono gauge and are thought to fall in the range of 50- to 100-year floods. Floodplain delineations for central Yosemite Valley are based on locations of high water during the 1997 flood and a flood study conducted by the U.S. Army Corps of Engineers (COE). The area inundated by the 1997 flood was not consistent with the COE 100-year floodplain. For this reason, where possible, decisions regarding use of floodplains should be based on the observed inundation zone, which is a more accurate representation of the floodplain. The return interval of the 1997 flood has not been precisely determined, but documentation of this flood (which was the largest on record) would provide the best information for future decisions.

Water Quality

Groundwater quality is generally good in the park. It is the sole source of potable water in Yosemite Valley. There are locations where relatively high iron concentrations in groundwater result in a reddish deposit on the substrate surface (e.g., lower Tenaya Creek), but iron is not a water quality threat. Federal regulations ensure that potable water systems are within set levels for turbidity, waterborne viruses and bacteria, and trihalomethane. Regulations also provide for monitoring and inspections.

Surface water is not used for potable water. Potential sources of surface water contaminants have included the concession and NPS stables and corrals. The concession stables are near Tenaya Creek, a tributary to the Merced River. Corrals and hitching posts are generally used to keep the stock in designated locations.

Recreational use can result in an increase of several contaminants in the Merced River. Primary impacts are due to erosion and water contact. Soil erosion caused by foot traffic along the river and streambanks and by compacted soils along trails can result in increased turbidity and solids concentrations.

Runoff has the potential to discharge several contaminants into the Merced River and its tributaries (e.g., solids, nutrients, coliforms and other microbes, and organics).

Pesticides and herbicides are used in the park. Federal guidelines are followed for application and disposal. The impact to water quality is unknown. All hazardous waste generated in the park is transported and disposed of outside of the park in accordance with federal and state guidelines.

All of the facilities and campgrounds in Yosemite Valley are connected to a sewage collection system. Wastewater is conveyed to the El Portal Wastewater Treatment Plant.

AIR QUALITY

Regulatory Overview

Yosemite is classified as a mandatory class I area under the Federal Clean Air Act (42 USC 7401 *et seq.*). This most stringent air quality classification is aimed at protecting parks and wilderness areas from air quality degradation. The act gives federal land managers the responsibility for protecting air quality and related values, including visibility, plants, animals, soils, water quality, cultural and historic structures and objects, and visitor health from adverse air pollution impacts.

Tuolumne and Mariposa Counties are within the Mountain Counties Air Basin; Madera County is within the San Joaquin Valley Air Basin, which is part of the San Joaquin Valley Unified Air Pollution Control District; and Mono and Inyo Counties are in Great Basin Valleys Air Basin on the east side of the Sierra. The Yosemite Valley is in Mariposa County, which is regulated by Mariposa County Air Pollution Control District.

National Ambient Air Quality Standards

The Federal Clean Air Act, as amended in 1990, requires the Environmental Protection Agency to identify national ambient air quality standards (NAAQS) to protect public health and welfare. Standards have been set for six pollutants: particulate matter less than 10 microns (PM_{10}), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), ozone (O_3), and lead (Pb). These pollutants are called criteria pollutants because the standards satisfy criteria specified in the act. An area where a standard is exceeded more than three times in three years can be considered a nonattainment area subject to planning and pollution control requirements that are more stringent than areas that meet standards.

State Ambient Air Quality Standards

The California Air Resources Board has set ambient air quality standards to protect public health and welfare that are more strict than the national standards. State standards are also identified in table 12. Under the 1988 California Clean Air Act air basins were designated as attainment, nonattainment, or unclassified for the state standards. Table 12 shows the California and federal air quality standards attainment designation for Yosemite National Park.

State Implementation Plan

Mariposa County Air Pollution Control District is responsible for developing a state implementation plan for federal and state nonattainment pollutants in its jurisdiction. State implementation plans define control measures that are designed to bring areas into attainment. Currently Mariposa County is in attainment or is unclassified for all National Ambient Air Quality Standards. Mariposa exceeds two California ambient standards: ozone throughout the county and PM_{10} in Yosemite Valley. Basic components of a state implementation plan include legal authority, an emissions inventory, an air quality monitoring network, control strategy demonstration modeling, rules and emission limiting regulations, new source review provisions, enforcement and surveillance, and other programs as necessary to attain standards. Emission sources are broken into four main categories: stationary, off-road mobile, on-road mobile, and biogenic. Appendix F lists pertinent Mariposa County ozone and PM_{10} rules and regulations.

Conformity Rule

In 1993 the Environmental Protection Agency adopted regulations implementing section 176 of the Clean Air Act as amended. Section 176

TABLE 12: CALIFORNIA AND NATIONAL AIR QUALITY STANDARD ATTAINMENT STATUS FOR TUOLUMNE, MARIPOSA, AND MADERA COUNTIES

	Tuolumne		Mariposa		Madera	
Pollutant	California	National	California	National	California	National
Ozone	N	U	N	U	N	N
Carbon monoxide	U	U	U	U	U	U
Nitrogen dioxide	A	U	A	U	A	U
Sulfur dioxide	A	U	A	U	A	U
Particulate matter	U	U	N[a]	U	N	N
Lead	A	U	A	U	A	U

Source: *Maps and Tables of the Area Designations for State and National Ambient Air Quality Standards and Expected Peak Day Concentrations and Designation Values*, January 1996.

[a]Only the Yosemite Valley portion of Mariposa County is in nonattainment.

N = nonattainment, U = unclassified, A = attainment

requires that federal actions conform to state implementation plans for achieving and maintaining the national standards. Federal actions must not cause or contribute to new violations of any standard, increase the frequency or severity of any existing violation, interfere with timely attainment or maintenance of any standard, delay emission reduction milestones, or contradict State Implementation Plan requirements. The conformity rule applies only in federal nonattainment areas. Conformity does not apply to activities in Yosemite Valley because Mariposa County meets all federal air quality standards; however, activities in Madera County must comply with the Conformity Rule.

Air Quality Conditions

Air Quality Monitoring in Yosemite National Park. Yosemite has an extensive air quality monitoring and effects research program. Ozone is monitored at Turtleback Dome and Wawona in Mariposa County and at Camp Mather in Tuolumne County. Turtleback Dome is also the location for the park's visibility monitoring array, which includes fine particulate monitoring and a transmissometer, as well as acid precipitation dry fall collectors. An additional PM_{10} monitor operates in Yosemite Valley. In addition to the monitoring being conducted in the park, there is extensive air quality monitoring near the park by state and local air pollution control districts (see table 13).

TABLE 13: AIR QUALITY MONITORING NEAR YOSEMITE NATIONAL PARK

		Pollutant[1]					
County	Community	TSP	SO_2	O_3	CO	NO_x	Others
Fresno	Clovis			x	x	x	PM_{10}
	Coalinga	x		x	x	x	NO_2
	Firebaugh			x			
	Five Points	x	x	x	x	x	NO_2, O_x, PM_{10}, fine part.
	Fresno	x	x	x	x	x	NO, NO_2, HC, O_x, PM_{10}, fine part.
	Parlier	x		x	x		O_x
	Shaver Lake			x			O_x
Madera	Madera	x		x			PM_{10}
Mariposa	Yosemite N.P.			x			PM_{10}, fine part.
Merced	Los Banos	x		x			PM_{10}
	Merced	x		x	x	x	NO, NO_2, HC, PM_{10}, fine part.
Mono	Bodie						PM_{10}
	Lee Vining	x					PM_{10}
	Mammoth Lakes	x		x	x		PM_{10}, fine part.
	Mono Lake	x					PM_{10}
Tuolumne	Columbia	x					
	Sonora	x			x		
	Tuolumne	x					
	Yosemite N.P.			x			

1. TSP = total suspended particulates
SO_2 = sulfur dioxide
O_3 = ozone
CO = carbon monoxide
No_x = nitrogen oxides
PM_{10} = fine particles — 10 microns
NO_2 = nitrogen dioxide
O_x = oxidants
NO = nitric oxide
Fine Part. = fine particles (2.5 microns)

Yosemite Valley Inventory of Air Pollution Emission Sources

Air quality in the park is affected by internal and external air pollution sources. Table 14 lists the major stationary air pollution sources within 100 kilometers of Yosemite's boundary.

Internal air pollution sources include mobile source emissions, combustion by-products, campfires, wood stoves, and prescribed fire. Mobile source emissions include carbon monoxide, nitrogen oxides, hydrocarbons, particulate matter, lead, and sulfur dioxide.

TABLE 14: MAJOR STATIONARY AIR POLLUTION SOURCES WITHIN 100 KILOMETERS OF YOSEMITE NATIONAL PARK

State	County	Community	Source	Pollutant(s)
California	Amador	Ione	American Lignite	TSP, HC
			Ione Energy	TSP, CO, SO_2, NO_x
		Martell	Georgia Pacific	TSP, CO, NO_x, HC
			Martell Cogen	TSP, CO, NO_x, HC
	El Dorado	Camino	Michigan-California Lumber Co.	TSP, CO, SO_2, HC
	Fresno	Auberry	Auberry Energy	NO_x
		Fresno	Danish Creamery Assn.	NO_x
			IND Asphalt	NO_x
			PPG Industries	NO_x
			So. Pacific Pipeline	HC
			Ultra Power	NO_x
		Kerman	Industrial Agrico	NO_x
		Kingsburg	Guardian Industries	NO_x
	Madera	Chowchilla	Anderson Clayton Oilseed	HC
		Firebaugh	California Ag Power Co.	NOx
		Madera	Madera Glass	NO_x
		(Rural)	Stewart and Nuss	TSP
	Mono	Lee Vining	H.E. Hunewill Construction Co.	SO_2
	Merced	Atwater	Castle A.F.B.	HC
		Livingston	Foster Farms Feed Mill	TSP
			E & J Gallo	HC
		Merced	Merced Color Press	HC
			Merced Milling Co.	TSP
			Ragu	SO_2, NO_x
		Snelling	Western Stone - River Plant	TSP
	Stanislaus	Modesto	Gallo Glass Co.	TSP, NO_x
			Modesto Irrigation Dist.	NOx
			Tri-Valley Growers Plant 7	SO_2, NO_x
		Oakdale	Beatrice Hunt Wesson	SO_2
		Riverbank	Silgan Container Corp.	HC
	Tuolumne	Jamestown	Pacific Ultrapower Chinese	NO_x
			Sierra Rock Products, Inc.	TSP
			Sonora Mining Corp.	TSP
		Standard	Fibreboard Corp.	TSP, CO, NO_x
Nevada	Douglas	Gardnerville	Sierra Timber	TSP
	Lyon	Dayton	Dayton Sand & Gravel	TSP
		Fernley	Nevada Cement	TSP, SO_2
		Yerington	Sierra Pacific	CO_2, NO_x
	Mineral	Hawthorne	U.S. Army Ammunition Plant	SO_2, NO_x
		(Rural)	Aurora Partnership	TSP
			Corona Gold, Inc.	TSP
			Kennicott Rawhide	TSP

Note: Major pollution sources emitting more than 100 tons per year of one or more regulated pollutants.

Quantities of air pollutants related to vehicle emissions in the park could change. Air pollution emissions have been assessed in the *Air Quality Analysis of Transportation Alternatives for Yosemite National Park, California.*

Other Air Quality Issues

Transportation. Visitation to Yosemite has increased steadily over the last decade. Visitation to Yosemite totaled nearly four million in 1992. A strong seasonal visitor pattern is evident at Yosemite, with low visitation in the winter, very high visitation in July and August, and moderate visitation in the spring and fall months. Monthly visitation totaled more than 600,000 in both August 1991 and August 1992. Future visitation forecasts indicate that growth would occur primarily in the shoulder season, with maximum monthly visitation remaining at about 600,000.

Visibility. Visibility refers to the clarity of the atmosphere and is typically measured as the distance that can be seen at a particular location and time. The absorption and scattering of light by both gases and particles in the atmosphere restricts visibility. Natural factors that contribute to decreased visibility include smoke from naturally ignited fires, fog, precipitation, blowing dust and snow, and relative humidity above 70%. Activities that reduce visibility include smoke from prescribed fires and combustion of fossil fuels; the emissions transform in the atmosphere into tiny visibility-reducing particles, or aerosols.

TABLE 15: EMISSIONS SUMMARY — SCENARIOS WITH DIESEL BUSES (TONS/YEAR)

Pollutant (tons/ year)	Scenarios											
	No Action		Taft Toe		Pohono Quarry		Driving Restrictions		Park Boundary		Gateway Communities	
	1995	2015[1]	1995	2015	1995	2015	1995	2015	1995	2015	1995	2015
VOC	200	90	174	83	170	81	184	89	135	63	107	48
CO	1,681	261	1,431	232	1,395	227	1,538	245	1,042	177	747	131
NO_x	198	73	192	77	192	78	192	71	186	99	163	112
PM	3.8	2.5	3.7	2.4	3.6	2.4	3.8	2.5	2.9	1.9	2.1	1.4
SO_2	8.3	6.9	8.2	6.8	8.1	6.8	8.3	6.9	7.6	6.5	6.8	5.8

1. Reductions in the no-action scenario over time are attributable to more stringent vehicle emission standards and California clean fuel regulations, which are also reflected in the other scenarios.

TABLE 16: EMISSIONS SUMMARY — SCENARIOS WITH NATURAL GAS BUSES (TONS/YEAR)

Pollutant (tons/ year)	Scenarios											
	No Action		Taft Toe		Pohono Quarry		Driving Restrictions[1]		Park Boundary		Gateway Communities	
	1995	2015[2]	1995	2015	1995	2015	1995	2015	1995	2015	1995	2015
VOC	200	90	178	88	176	88	—	—	155	83	136	77
CO	1,681	261	1,434	236	1,399	234	—	—	1,054	199	765	164
NO_x	198	73	189	74	187	74	—	—	168	81	132	82
PM	3.8	2.5	3.7	2.4	3.6	2.3	—	—	2.9	1.9	2.0	1.3
SO_2	8.3	6.9	7.9	6.6	7.7	6.4	8.3	6.9	6.2	4.9	4.4	3.2

1. Shuttle buses are not envisioned in this scenario.
2. Reductions in the no-action scenario over time are attributable to more stringent vehicle emission standards and California clean fuel regulations, which are also reflected in the other scenarios.

California has a standard for aerosols. Mariposa County is unclassified with respect to the state visibility standard.

Health Effects of Air Pollution. Studies by the American Lung Association have shown that 60,000 premature deaths per year are caused by elevated PM_{10} levels. Yosemite Valley exceeds the California 24-hour PM_{10} standard (50 $\mu g/m^3$) and reports at least two values greater than 120 $\mu g/m^3$ between 1992–1994, and human health may be at risk. Appendix F lists the human health effects of each criteria pollutant.

Scenic Quality. The spectacular scenery of Yosemite Valley is the primary attraction for millions of park visitors. The *General Management Plan* identified primary scenic vistas in the valley, and vista points have been identified (see table 17).

TABLE 17: VISTA POINTS AND SCENIC VISTAS

Vista Point	Elevation	Scenic Vistas	Access	Current Development Visible	Taft Toe / Pohono Visible
Discovery View (Tunnel View)	4,410	Bridalveil Falls, Cathedral Rock and Spires, El Capitan, Washington Column, Half Dome	Vehicle, foot trail		Pohono
Bridalveil straight-a-way	3,920	El Capitan, Cathedral Rock and Spires	vehicle, foot trail	no	no
Valley View	3,908	Bridalveil Falls, El Capitan	vehicle, foot trail	no	no
Dewey Point	7,385		foot / ski trail		Pohono
Taft Point	7,400		foot trail		Taft Toe
Upper Yosemite Falls	6,936	Yosemite Falls, Sentinel Rock	foot trail	Yosemite Lodge, Yosemite Village, Yosemite Elementary School, NPS housing	no
Sentinel Dome	8,122	Yosemite Falls, Three Brothers	foot trail		no
Glacier Point	7,214	Half Dome, Yosemite Falls	vehicle, foot trail		no
El Capitan meadow	3,955	El Capitan, Cathedral Rock and Spires, Half Dome	vehicle, foot trail	no	no
Chapel straight-away	3,965	Yosemite Falls, Eagle Peak, Royal Arches, Washington Column	vehicle, foot trail	chapel	no
Sentinel Bridge	3,955	Half Dome	vehicle, foot trail	Sentinel Bridge	no
Four-Mile Trailhead	3,960	Sentinel Rock, Yosemite Falls	vehicle, foot trail	no	no
Columbia Point	5,031	Sentinel Rock, Three Brothers	foot trail	Yosemite Lodge, Yosemite Village, Yosemite Elementary School, NPS housing	no
Lower Falls View		Lower Yosemite Falls	foot trail, vehicle	Yosemite Lodge, restrooms	no
Cook's Meadow		Yosemite Falls, Three Brothers, Sentinel Rock	vehicle, foot trail	Yosemite Village, Residence #1, Yosemite Elementary School, NPS housing	no

Vista points have been established along roads, as vehicle destinations, along trails, and as hiking destinations. Many historic views are currently obscured as a result of forest encroachment associated with lowered water tables and a lack of periodic fire.

Table 17 lists the vista points and their available views. The scenic quality of many of these features would be enhanced under alternatives that restore areas at the east end of the valley.

NOISE

Natural sources of sound in Yosemite Valley include waterfalls, rushing water, wind, and wildlife. There is also noise from human activities and mechanical devices like automobiles, trucks, transit buses, motor coaches, and generators. Human-caused and natural sources of noise are about equal except near roads, lodging areas, and campgrounds, where human noise predominates. Preserving natural quiet (and natural sounds) and reducing human-caused sounds, including those from cars, buses, and aircraft, is a major NPS objective.

Ambient (background) noise levels around Yosemite Valley are commonly in the 60 to 65 dBA range. As a point of reference, a conversation between two people would typically measure about 60 dBA. Sound levels above 80 dBA can cause hearing loss if prolonged. Rushing water is the principal source of natural background sound. Areas adjacent to Yosemite Falls or the Merced River, for example, have relatively higher background noise levels than areas farther from these features. During the periods of highest visitation, Memorial Day to early August, background noise levels decrease correspondingly with decreasing amounts of rushing and falling water.

Human noise is heard throughout Yosemite Valley and adds one or two decibels to the total background noise levels. Vehicles cause the loudest human-caused noises in the valley. Table 18 shows relative noise levels for various vehicle types (Aerovironment 1973). The highest recorded levels are in excess of 80 dBA (about as noisy as a vacuum cleaner). These are generated by buses at maximum speed in the valley.

TABLE 18: NOISE LEVELS OF VARIOUSVEHICLES IN YOSEMITE VALLEY

Vehicles at constant speed	dB(A)	Vehicles slowing or idling	dB(A)
Diesel shuttle bus	77	Diesel shuttle bus	71
Electric shuttle bus	72	Electric shuttle bus	67
Motor coach	84	Motor coach	70-80
Motorcycle	74	Misc. autos	64-69
Pickup truck	74		
Misc. autos	68-71	Maximum brake noises from both diesel and electric shuttle buses	80

Source: Aerovironment 1973

ARCHEOLOGY

Yosemite Valley was probably inhabited at least 4,000 years ago and perhaps as long as 6,000 years ago. Evidence from El Portal suggests that the river valley west of Yosemite Valley may have been inhabited as early as 9,500 years ago. The valley contains many archeological sites with evidence of thousands of years of human occupation. There is evidence of at least one population replacement, technological change through time, a highly developed trade network, and significant environmental manipulation through fire.

Prehistoric sites contain a variety of features and objects. Flaked stone waste and tools are the most predominant. Pounding and grinding rocks are abundant. There are rock shelters, hearths, rock alignments, pictographs, and human burials. Archeological objects include obsidian, chert, quartz, and metasedimentary lithic tools and debitage; pigment; shell ornaments; and dietary animal remains.

Historic sites contain trash deposits, building foundations, privy pits, utilities, human burials, and landscape features such as ditches, roads, rock alignments, exotic plants, and trails.

All of the recorded prehistoric and historic American Indian sites lie within the boundaries of the Yosemite Valley archeological district and were determined eligible for listing on the National Register of Historic Places (NPS, Anderson and Morehead, 1978). These resources were recognized for their potential to contribute important comparative information regarding:

- prehistoric settlement and use of the Sierra Nevada
- the nature of land use in the 4,000–5,000 foot elevation zone
- seasonal vs. year-round use
- prehistoric economic systems, technology and social organization
- American Indian contact and interaction with outside cultures and acculturation

Over 100 sites have been recorded in Yosemite Valley. Early archeological surveys focused on prehistoric or historic Indian sites rather than historic-era resources representative of homesteading, visitor, and NPS facilities. The entire valley has been surveyed except for wet meadows, areas of impenetrable vegetation, and some talus slopes.

Five recent studies provide important information about the archeology of Yosemite Valley:

An Archeological Inventory of Yosemite Valley, Yosemite National Park, California, Report of Selected Subsurface Archeological Investigations in Yosemite Valley, 1986 – 1991, Yosemite National Park, California presents results of subsurface survey, test, and data recovery excavations at 18 archeological sites. Results include an assessment of site data potential and integrity and management recommendations.

Archeological Test Excavations and Monitoring at CA-MRP-56 and -301, Yosemite Valley, Yosemite National Park summarizes results of test excavations and construction monitoring in Yosemite Village. Results include discussions of dense material culture deposits and recovery of human remains.

The 1984 and 1985 Yosemite Valley Archeological Testing Projects summarizes results of archeological investigations at 10 archeological sites. Results include discussions of ethnohistoric Indian occupation, pre-Crane Flat period (early) occupation, and baseline descriptions for lithic artifacts in Yosemite Valley.

An Archeological Synthesis and Research Design for Yosemite National Park, California (draft) presents a comprehensive synthesis of archeological research between 1981 and 1996 and proposes important archeological research and management strategies for future work.

Studies conducted since the national register nomination have also demonstrated the potential for important paleoenvironmental data that can be correlated to archeological resources (Anderson and Carpenter 1991). Evidence of American Indian acculturation is significant because Yosemite Valley is one of the only areas in California with close correlation between historically reported American Indian villages and archeological sites (Merriam 1976). Central villages appear to be dispersed in the western end of Yosemite Valley and concentrated in the east end.

While the majority of archeological sites in Yosemite Valley retain a relatively high degree of integrity, many have been disturbed by human activity and natural processes (NPS, Hull and Kelly, 1995b). Visitor use has the most widespread impact, although its effect is not as serious as other types of impacts. Several sites have been damaged by construction of facilities and utilities. A significant number have been affected by ongoing natural processes such as tree falls, river migration, alluviation, and rockfall. Because Yosemite Valley is such a geologically active place, there is a high potential for buried archeological resources, especially in areas of alluviation and rockfall.

ETHNOGRAPHY

When Euro-Americans first entered Yosemite Valley in 1851 the American Indian groups living there were the Southern Sierra Miwok and the Paiute. Their own oral tradition and archeological evidence suggest that they had been there a long time, perhaps as early as A.D. 1200. Incursions or affiliations with new groups appear to have resulted in the introduction of new cultural and linguistic patterns, but the cultural and geographical heritage of the 19th century groups can be traced back to the 13th century. Southern Miwok people called Yosemite Valley *awahni,* "place like a gaping mouth." The Miwoks living in the valley were known as the *awahnichi*, "people who live in *ahwahni.*"

Although changes resulted from encounters with other cultures, American Indian life was relatively stable in Yosemite from A.D. 1200 to 1800. The people wintered in villages at lower elevations along the Merced and Tuolumne Rivers and summered in Yosemite Valley. Some may have spent winters in the valley, settling in sunny locations on the north side of the Merced.

Villages were sometimes large. Conical dwellings were constructed of pine poles, were covered with brush and cedar bark, and had fire pits in the center of earth floors. Lean-tos were used for summer shelter. Ceremonial structures were large and had post support systems as well as earthen roofs. Dwellings were furnished with beds and seats covered with grass or pine needles and had woven fur or pieced hide blankets. Baskets were the primary containers and were often hung from the walls. They contained tools as well as processed foods, such as dried meat, fruits, mushrooms, and greens. Nuts and seeds were gathered for food, and these were stored in elevated containers made from brush and located near the dwellings.

Clothing was simple. Men wore deerskin breechcloths or less; women deerskin skirts; children ordinarily wore nothing. In cold weather blankets were worn. Most people went barefoot, although moccasins were used for travel over rough terrain. Hair was worn long and was sometimes tied back or confined with a headband. Both sexes wore ornaments.

Leadership in the group was hereditary, and leaders were often rich in baskets, clothing, and other goods. Both men and women were leaders. Most marriages took place out of the immediate group and between individuals of similar social rank.

Trade with other groups was important both socially and economically and took place with groups living east of the Sierra crest and with people living west of the valley.

The arrival of the Spanish in California in the late 18th century brought profound changes. Spanish soldiers and missionaries established a

chain of missions and settlements along the coast and began an aggressive campaign to convert the native population to the Catholic religion and European lifeways by capturing and confining them at missions. When the mission system was abolished by Mexico in 1836–40, the captives were released. By then, their homelands, mostly west of the Sierra, were occupied by Euro-Americans. The displaced groups migrated to the Sierras, aligning themselves with people living there. Then, between 1830 and 1840, epidemics brought by Europeans swept over the continent. In central California, the American Indian population was decimated. Survivors fled to neighboring villages and often into the high Sierra. The Ahwahneechee, living in Yosemite Valley, almost certainly felt the impact of these events, although they appear to have retained most of their traditional lifeways.

The acquisition of California by the United States in 1846 and the discovery of gold in the high Sierra in 1849 brought profound change. The flood of Euro-Americans with their ideas about landownership, individual enterprise, and profit taking created havoc for American Indians. Land was closed to them for hunting and harvesting and was cleared for construction. Euro-American cultural attitudes had little regard for American Indian rights or values.

The Mariposa Indian War began in 1850, triggered when Indians killed three men at a trading post on the Fresno River. A call went out for volunteers to pursue the Indians, capture them, and relocate them to a reservation on the Fresno River. The battalion formed was the first to enter Yosemite Valley. There they encountered the Ahwahneechee, led by Tenaya, who declined, on behalf of his people, to leave. Some of the group were taken prisoner and led out of the valley, but all seem to have escaped and returned home before reaching Fresno River. Later expeditions also captured members of the group, but no confinement was successful, and the Ahwahneechee remained in the valley.

Disease, dislocation, and the conflict of divergent cultures dramatically reduced the American Indian population. It is estimated that Sierra Miwok population dropped from approximately 9,000 individuals to 760 in the 60 years before the 1910 census (Cook 1943).

After 1851, as the fame of Yosemite Valley grew, its beauty and geological phenomena attracted tourists, scientists, artists, and photographers. Hotels and other travel-related amenities sprang up. In the late 19th and throughout the 20th centuries, American Indian descendants of some of the valley's original populations found employment in these enterprises, and, for a time, continued to live in the villages their people had occupied there. Management of the valley was given to Euro-American institutions, and American Indian interests were subject to decisions made without their influence. Traditional housing was replaced with nontraditional structures; old village sites were vacated, and new villages were built. The small groups that came together in these settlements combined cultural practices, crafts, and beliefs and lived in the valley until 1969. Then the last of their dwelling places in the valley were closed and razed.

Since that time, American Indians still working in the valley have dispersed or settled in nearby Euro-American communities. Several have retained their association with the valley as employees and cultural demonstrators as part of the National Park Service's interpretive programs. They have worked with the National Park Service to build and maintain the Indian Village of Ahwahnee behind the Yosemite museum. There examples of traditional dwelling, utilitarian, and ceremonial structures preserve and interpret past lifeways.

Research Status

An Ethnographic Evaluation of Yosemite Valley: The American Indian Cultural Landscape (NPS, Bibby, 1994e) identified and documented cultural and natural resources associated with American Indian occupation and use of the valley. American Indians still living in the region provided oral history and assisted in the location of resources. All known and reported

American Indian burial places were also inventoried.

Resource Description

The inventory of ethnographic resources surveyed and analyzed all cultural and natural resources associated with American Indians in the valley. The area surveyed was from Pohono Bridge to Mirror Lake and Happy Isles and included all historic areas of human habitation, sites of traditional and contemporary spiritual value, marked and unmarked graves, and areas of past and present resource gathering and food processing. Included were such features as bedrock mortars and plant materials such as black oak groves and individual trees, grasses, mosses, sedges, and mushrooms. Most sites and features are historic, and tradition holds that many have long histories of use.

The survey identified 104 sites, features, and botanical species as having been used by American Indians. Forty-seven sites are either historic villages or other historic features. There are 16 sites with mythic or ceremonial value, 27 with food and water sources, 20 with plants used in making baskets and other utilitarian objects, and four with medicinal plants.

In the valley west of El Capitan, El Capitan Meadow, and Cathedral Rocks there are 27 sites; 22 are in the central valley. Thirty-one are in a zone defined by Eagle Peak, Leidig Meadow, and the toe of Illilouette Ridge and Lehamite Creek, while 24 are between Lehamite Creek, the toe of Illilouette Creek, and Mirror Lake/Happy Isles.

There are nine historic American Indian burials in the cemetery. Two reburials of excavated remains were made in the cemetery in the 1970s. A burial site was recorded near the valley district building. An unmarked grave is reported to be in the area of El Capitan, and there is an early account of a cremation in the valley. The sites have not been located.

Management Status

An Ethnographic Evaluation of Yosemite Valley: The American Indian Cultural Landscape recommended that all of Yosemite Valley be designated as a traditional cultural property and national register district, meeting the requirements of national register criteria A – associated with events that have made a significant contribution in the broad patterns of our history; criteria B – associated with the lives of persons significant in our past; and criteria C – embodying a distinctive characteristic of a type, period, or method of construction. The recommendation has not yet been forwarded with nomination forms for a determination of eligibility.

The following village sites have been recommended for individual national register listing under criteria D – sites that have yielded, or may be likely to yield, information important in prehistory or history: Wahoga (New Indian Village); Yowatchke (Old Village) CA-MRP-57, Cultural Landscape #71; Loiyah, CA-MRP-83, Cultural Landscape #38; Hollow, CA-MRP-57, Cultural Landscape #88; and Ahwahnee, CA-MRP-56, Cultural Landscape #62. This recommendation has not been forwarded with nomination forms for a determination of eligibility.

HISTORY

During the 1860s Yosemite Valley was brought to America's attention through various articles written by Thomas Starr King in the *Boston Evening Transcript* and by James M. Hutchings in *California Magazine*. Sketches of Yosemite Valley by Thomas A. Ayers were widely circulated in publications and travel guides. In 1864 Hutchings became a permanent resident of Yosemite Valley and built the first documented Caucasian settlement in the valley. He built several structures, including a saw mill. Others followed and built hotels, planted orchards, and developed homesteads, most of which were placed in areas with outstanding views. In 1864 President Lincoln and the Congress set aside the Big Tree Grove (Mariposa Grove) and Yosemite Valley as a public park. The purpose of the grant

was to preserve monumental scenic qualities rather than an ecosystem. The act clearly stipulated that the valley and the Mariposa Grove were to be managed by the governor of California and eight commissioners appointed by him. The eight commissioners were: Frederick Law Olmsted, J. D. Whitney, William Ashburner, I. W. Raymond, E. S. Holden, Alexander Deering, George W. Coulter, and Galen Clark (NPS, Greene, 1987).

A heightened awareness of the landscape was provided through the works of artists such as Thomas Ayers, Albert Bierstadt, and Carleton Watkins. Yosemite Valley was becoming known through artistic interpretation, literature, and the visual arts. All of these encouraged people to see the park in person.

Agriculture

By 1870 the establishment of hotels had created a need for local fresh produce and livestock. James Lamon, Yosemite Valley's first white homesteader, became one of the largest producers of commercial agricultural products in the valley. Lamon gardens and orchards produced strawberries, raspberries, blackberries, apples, pears, and other fruits. Two of his apple orchards still exist. One is in the Curry Village parking area but has been altered, including paving. The other, which retains much of its original character, is located near the Curry Stables at the east end of Yosemite Valley. Leidig's meadow was sown with timothy hay until 1888 when wheat began to be grown.

With the introduction of vegetation and livestock came fences, outbuildings, and other developments that detracted from the beauty of Yosemite Valley. Introduced vegetation became a concern. In 1888 Frederick Law Olmsted outlined a policy for management of the valley. Cultivation of crops was to be restricted to areas that had already been plowed, natural meadows were to be preserved, and tree cutting was to be permitted only under the supervision of a landscape gardener.

The first director of the National Park Service, Stephen T. Mather, saw the importance of the writings of Andrew Jackson Downing and the works of Frederick Law Olmsted. Mather strongly advocated the subordination of the built environment to the natural environment.

The rangers' club was originally designed to cater to the housing needs of single male rangers. It is an example of Rustic architecture in Yosemite Valley. The Rustic style uses materials that are harmonious with their surroundings. Housing and structures built in the area followed the example set by the rangers' club. The historic housing area today reflects the changing needs of the NPS staff and its operations from 1916–1958. The need to accommodate the automobile and the changing demographics of residents have contributed to the current configuration of the village.

The housing area has retained much of its integrity and is listed on the National Register of Historic Places (1977). The area is rich with both historic and prehistoric sites and includes a national register archeological district, a cemetery, many unmarked burials, historic homestead sites, and bedrock mortars. All phases of NPS architecture are present — structures designed and built by the U.S. Army, fine examples of Rustic architecture and landscape design and examples of Mission 66 architecture. Mission 66 was a congressionally approved and financed program under which a great deal of construction took place, including residences.

Major H.C. Benson, acting superintendent from 1905–1908, stated in his annual report in 1907 that, "Some definite general plan should be devised for the beautifying of the valley and making it the most beautiful park in the world. All bridges and buildings constructed in the future should conform to a definite plan, suited to existing conditions. All roads should be laid out according to a plan fully worked out by a competent landscape gardener, nothing should be done in the way of expending money which does not tend to carry out these ideas. All small buildings, practically shacks should be replaced

by stone buildings, and all bridges, when replaced, should be either of stone or concrete."

By 1914 Yosemite Valley was filled with substandard and unsightly structures, many of which were built by the army for seasonal use. Other structures were built by entrepreneurs in the Old Village. In 1916, when park operations were no longer under the auspices of the Army, all structures were given to the Department of Interior. Several housing units were then used for NPS employees. Three of these structures are still being used as housing today and a fourth serves as office space for NPS employees. One of the three residential structures has been renovated for year-round habitation.

In 1915 at the Panama Pacific Exposition, Mark Daniels, the first landscape engineer hired by the Department of the Interior, discussed the philosophy that would be used to lay out the national parks. He had created a master plan for Yosemite Valley with roads, varied accommodations, stores, and utilities.

Director Steven T. Mather relied on landscape architects to ensure that buildings were compatible with their sites. Yosemite has been an important laboratory for the NPS philosophy on the built environment. Key figures in the history of NPS architecture completed much of their early work on projects in the park. Charles Punchard, the first head of the NPS Landscape Engineering Department, worked on laying out the current Yosemite Village. Daniel Hull, his successor, worked on improved circulation. When Thomas Vint (successor to Hull) headed the program, elements were contributed that are important to the character of Yosemite Village, including low-density massing of the housing, careful materials selection, curvilinear streets, detached houses with garages and service alleys, and the preferred use of vegetation. During these periods, many important architects and landscape architects were influential in the parks. Stanley Underwood designed the Ahwahnee, and the Olmsted Brothers firm designed the grounds for the hotel. Beginning in 1933, many of the people who had worked in Yosemite were producing designs used by the Public Works Administration under John Wosky, another prominent NPS figure. Between 1950 and 1956, seven structures were built in Yosemite Village. Only one was built in the Rustic style; the others were in the Mission 66 style.

The historic Yosemite Village housing area was included in the *Cultural Landscape Report For Yosemite Valley* (NPS 1994c). This document identified character-defining features and suggested areas of additional study. The historic housing area retains a substantial amount of integrity. Building configuration, color schemes, vegetation, circulation patterns, and street furniture have remained subordinate to the natural landscape. The modifications and new uses have not impacted the integrity of the design from the period of significance (1920–1955). The Yosemite Valley housing area has 1- and 2-story structures with shake roofing. The siding is lap, staggered shakes, or vertical siding, and foundations, chimneys, and fireplaces are granite rubble. Garages and storage buildings are also Rustic in style. Combined garages create a long bank well hidden by vegetation and color. Streets access a system of alleys with garages and storage areas. Oaks and cedars create a tree canopy in which shake roofs disappear. Houses on the same street have a uniform setback with lawns.

There is no plan to increase the number of housing units in the historic housing area. Recently there have been some changes in the use of several historic houses. These uses have included offices, a child care facility, a high school, and the use of single-family residences as dormitory units for unrelated occupants. These uses put a strain on the district because additional traffic has been created, and there is an increased need for parking. Some of the housing converted to office space has no adjacent parking. People have begun to park on lawns and on tree roots. Child care facilities are required to have intruder-proof fencing.

Modern residents have added satellite dishes, hot tubs, mobile homes, boats, children's play equipment, wood storage, propane tanks, and gardens. Most houses have inadequate closest

space, so many residents have resorted to using the garages and woodsheds for regular storage. Many cars are parked on the street, and large wood piles are visible from the street.

Due to the high cost of electricity, the National Park Service is converting all hot water heaters from electricity to propane. The National Park Service has installed recycling centers and bear-proof trash collection areas to accommodate the large quantities of trash produced by residents.

Roads and Trails

The first trails in Yosemite were created by American Indians. Several of these of these corridors are still in use (such as the Vernal and Nevada Falls trails) and have been improved over the years to accommodate users. Other trails built by early residents, concessioners, and the army still exist as social trails or as improved trails. By the mid-1870s toll stage roads and trails were built to accommodate people on foot, on horseback, and in carriages.

During the mid- to late-19th century most tourists came into Yosemite Valley after arduous journeys by boat, train, and horseback; later they came by stagecoach. The three most important roads during this time were Old Coulterville, Big Oak Flat, and Wawona Roads. In 1868 the Chinese Camp and Yo Semite Turnpike Company was formed. Their main intent was to build a toll road from Chinese Camp on the northern side of Yosemite through Big Oak Flat to Yosemite Valley. Construction was started in 1869. The labor force was composed largely of Chinese workers. The attempt was not successful, and the next attempt was made by the Coulterville Road and Yo Semite Turnpike Company. Due to financial problems by 1872 road construction had halted. Also in 1872 the Four-Mile Trail, owned by James McCauley, was completed as a toll trail. The Yosemite Grant in 1874 put pressure on the entrepreneurs to finish a carriage road. In 1874 the Old Coulterville and Big Oak Flat Roads were completed and, in 1875, the 27-mile Wawona Road was constructed. Due to the poor national economy, visitation was not as high as had been expected after the completion of these carriage roads. Much money was lost and competition among the toll operators was fierce.

In the 1870s many entrepreneurs built roads and bridges in Yosemite Valley. Entrepreneurs built the road to Mirror Lake (1874), the Yosemite Falls Trail (1877), and El Capitan Road (1878).

Also during the mid- to late-19th century there were mixed feelings about the natural beauty of Yosemite and the willingness to alter it for human convenience. As early as 1860 there are reports of enhancing the dam at Mirror Lake The single event that had the most influence on the cultural landscape in Yosemite Valley was the blasting of the moraine at the foot of El Capitan (1879). This action forever changed the Merced River, the valley stream system, and vegetation.

From 1880–1890 there was a boom in the construction of roads and bridges in Yosemite Valley. The carriage road circled the valley floor and is in use today. In conjunction with the completion of the Loop Trail, there was an elaborate system of wooden bridges and stone culverts. Many of these bridges were rebuilt in their original locations when structures were washed out. In 1889 the first rip-rap was installed to protect a Sugarpine tree adjacent to the bridge that bears its name.

In 1907 the Yosemite Valley Railroad was completed to transport passengers from Merced to El Portal and to facilitate logging in the area. Built by the railroad to connect El Portal with Yosemite National Park, the road defied the conventional wisdom that a road could not be constructed up the rugged Merced River canyon. This wagon road was reconstructed in 1920 to accommodate automobile traffic (NPS, Quinn, 1991). The original road went from El Portal to a junction with the Old Coulterville Road and then into the valley. As early as 1915 organizations such as California Automobile Association were very vocal about the needs of automobile travelers to California parks. During the early part of the 20th century vacation travel became

more common, and automobiles became affordable to many working-class people.

Today the El Portal Road starts in El Portal and ends at Pohono Bridge in Yosemite Valley. It is known for its extensive rock work, curvilinear features, breathtaking views, low elevation, and generally snow-free condition. This road set the stage for the large number of tourists who influenced most of the 20th-century development of Yosemite Valley.

From 1916–1927 roads, trails, vista points, and buildings were carefully planned and executed to enhance the visitors' experience. During the design process civil engineers focused on the practical and technical details of road construction, including drainage, excavation, grade, surface, revetments, culverts, and bridges. Meanwhile landscape architects were interested in aesthetic and scenic concerns, such as the location of the road, provisions for viewpoints and vistas, the external character of structures, and the creation of a smooth road.

The elaborate circulation system separated bridal paths, pedestrian trails, and fire and service roads. It incorporated viewing areas. Bridges were designed to mitigate the potential conflicts of human, horse, and automobile use. For example, Stoneman Bridge was built to provide an efficient way of getting horses close to water without conflicting with pedestrian or motor vehicle traffic. The road and trail system for visitors was placed to capture views. Roads and trails have been rerouted and uses have been changed over time. It is not uncommon to have pedestrians, motor vehicles, horses, and cyclists at an intersection or bridge.

In 1925 the Department of Agriculture, Bureau of Public Roads, and the National Park Service worked together to produce roads and bridges. The bridges that were built during this partnership included the Ahwahnee (1928), Clark (1928), Sugarpine (1928), Pohono (1928), Tenaya Creek (1928), Happy Isles (1929), and Stoneman (1933). The bureau also managed of the reconstruction of the road between El Portal and Pohono Bridge. Vegetation was planted to hide and minimize the built environment. Roads and trails were designed so that they did not compete with views. Extra effort was made to face bridges with stone veneers over structural steel and concrete. Native materials were used for road, rip-rap, and bridge construction.

By 1930 Yosemite's managers outlined areas of particular concern, including activities that encroached on meadows, such as the race track at Leidig's Meadow and the parking areas at Stoneman Meadow. The committee recommended that a landscape map record the areas occupied by forests, woodlands, chaparral, and meadows. They also wanted to document the historic distribution of natural landscape types from photographs and records.

The creation of the Public Works Administration made many individuals available for work. The Civilian Conservation Corps completed a tremendous amount of work at Yosemite, including construction of roads, trails, bridges, fire roads, fire buildings, fire lanes, fire trails, comfort stations, campgrounds, and a dam at Yosemite Creek. Projects included revegetation, extensive landscaping, and debris cleanup.

CULTURAL LANDSCAPES

Cultural landscapes are geographic areas that include both cultural and natural resources and are associated with a historic event, activity, or person or exhibiting cultural or aesthetic values. Five cultural landscapes have been inventoried in Yosemite Valley: Ahwahnee Hotel, Curry Village, Yosemite Lodge, Yosemite Village, and Yosemite Valley as a whole. All are historic designed landscapes or historic vernacular landscapes. The *Yosemite Valley Cultural Landscape Report* evaluated these landscapes and their character areas for significance.

Yosemite Valley

Periods of significance:

1851–1863 Pioneer period of exploration and occupation

1864–1889	State grant
1890–1905	State grant and national park
1906–1915	National park under federal/army administration
1916–1931	NPS administration
1932–1945	Depression era and World War II

The valley landscape is significant for its archeology, exploration/settlement history, architecture, recreation, art, landscape architecture, and conservation.

Most campgrounds occupy sites that are historically significant, but design, circulation, and landscape features have undergone various alterations over the years.

Many of the structures, including the nature center, the amphitheater in the Lower Pines Campground, LeConte Memorial Lodge, the rangers' club, Yosemite Valley Chapel, the stables, and the superintendent's residence (residence 1) are significant.

The meadows in Yosemite Valley are significant cultural landscape features, as are the Merced River and its tributaries. Three picnic areas in the valley date from the period of significance.

The Loop Road dates back to 1882, when it was a one-way carriage route.

The historic bridges in the valley date from the 1920s and 1930s. Four-Mile, Yosemite Falls, and Mist Trails are the earliest trails in the valley.

Some of the Valley Loop Trail/Bridle Path was originally part of the Valley Loop Road, while other sections were added to provide the links needed for a complete trail system.

Of the pedestrian bridges in the valley, some are historic. Others are newer but contribute to the significance of the trail. These include Swinging Bridge, the footbridges at Happy Isles, the CCC footbridge (superintendent's bridge), footbridge camp 7–16, the bridges over Indian Canyon Creek, and the Bridalveil bridges.

Most visitor activity takes place in the east end of Yosemite Valley, where visitor accommodations, campgrounds, concessioner facilities, and the major visitor facilities are located. The primary facilities are Yosemite Lodge, Yosemite Village, Curry Village, the stables, and the Ahwahnee Hotel.

Yosemite Village

The period of historic significance for Yosemite Village was from 1924 – 1945. This landscape is most significant for its architecture, art, and landscape architecture. The establishment of Yosemite Village in 1924 removed decrepit and unsightly buildings in the Old Village and Lower Village.

The Yosemite Village historic district is on the National Register of Historic Places. The maintenance, service, and storage area has changed little since the period of significance.

The Lower Tecoya housing area has had few changes. Only four buildings postdate the period of significance; all others were constructed during the early 1920s. Some cabins and dormitories were altered in the 1930s. The Upper Tecoya housing area has been changed considerably, and Middle Tecoya housing area has also changed. The medical center has been changed since the period of significance.

The Village Store, concession garage, and the visitor arrival/meadow area are also important elements of the landscape.

Ahwahnee Hotel

The Ahwahnee Hotel is a national historic landmark and is on the National Register of Historic Places. The hotel was created to provide first-class luxury service in an effort to attract wealthy and influential visitors to the valley. The hotel was designed to harmonize with the rugged valley walls. Its period of historical significance was from 1927 to 1945. This

landscape is most significant for its architecture and landscape architecture.

The building was designed by Gilbert Stanley Underwood. The grounds were designed by the Olmsted Brothers firm. The firm's use of native vegetation to create a wildflower garden, its manipulation of land forms to give the hotel the appearance of being on a natural knoll, the views to Yosemite Falls, and the entry sequence are notable features of the original design. The wood bungalows were built in 1928.

The visitor approach for the hotel also contributes to the significance of the area. The meadow and landscape elements are also important. The employee housing area has been changed, and most features appear to postdate the period of significance.

Curry Village

Camp Curry's facilities were designed to be more primitive than those of the Ahwahnee and were intended to serve a less affluent clientele. The Currys followed NPS design guidelines to produce buildings and structures that blended with the natural surroundings. The period of historic significance for Curry Village was from 1899 – 1945. The wooden bungalows and tent cabins are important elements of the landscape. The visitor arrival area has changed considerably. The use of the orchard for parking was first proposed by the Olmsted Brothers in 1927.

MUSEUM COLLECTIONS / LIBRARY / ARCHIVE / SLIDE ARCHIVE

The museum, library, archive, and slide archive collections are housed primarily in Yosemite Valley. There, in the Yosemite museum, collections are kept in a storage room and vault. Offices are nearby. The library, archive, and slide archive are on the second floor and in an under-eaves attic of the building. The Curry archives are stored in the concessioner's warehouse. Museum collections are also stored in two valley garages, in five historic buildings moved to Wawona's Pioneer Village, in the Wawona grey barn, and the Gore house. Large objects such as wagons are stored in El Portal, as are archeological and archival collections.

Resource Description

Yosemite's museum collection was founded in 1915 in the former Chris Jorgensen house, which became known as the Yosemite museum. The collections were subsequently moved to NPS headquarters in the Old Village and then moved again in 1926 to the museum building in the New Village designed by the American Association of Museums and funded by the Laura Spelman Rockefeller Foundation. It was the first officially designated museum in the national parks.

The museum collections are made up of objects directly relating to or collected in the park. Collection categories include natural history (biology, flora and fauna, geology), history (fine arts, photography, prints, decorative arts, furniture, firearms, clothing and vehicles), and archeology and ethnography (basketry, clothing, and utilitarian articles). The park's herbarium and entomological collections are renowned. They were started in the late 1920s and provide a baseline for species analysis and change. The ethnographic collection is the largest in the national park system and is distinguished by its exceptional California baskets. The archeological collections were excavated in the park and have significant value for comparative research purposes and for exhibition.

There are 1.7 cataloged objects on 92,000 museum records in the museum collection. There is a backlog of 500,000 uncataloged objects.

Yosemite's library was established in 1923 by the Yosemite Natural History Association in the museum building, where it remains. Originally on the first floor, it served the valley community as a general library until the 1930s, when it began to serve the visiting public and park staff as a research library.

The library has natural and cultural resource, recreation, and planning texts. Both scientific and general works are included. Its history collections are extensive and contain materials on Yosemite's discovery, early accounts and descriptions, the army's administration, park operations, innkeepers, concessioners, early settlers, buildings, Hetch Hetchy dam, Wawona, the Mariposa Big Tree Grove, roads, trails, place names, geology, plants, animals, boundaries, famous visitors, Indians, and guide maps, entrance folders, and information circulars from 1912 to the present. It has special collections of the *Yosemite Nature Notes* (1921–1961, 1977–1978); the American Alpine Club (climbing and mountaineering); and the Federal Women's Program (women's issues, career development, finances). There is a large collection of periodicals, and back issues are retained. The photograph collection consists of approximately 18,000 black and white photographs and is exceptional for its documentation of Yosemite's natural, cultural, and scenic resources over time. The natural history observation file records sightings of birds and mammals dating back to 1909. Also managed are clipping files, microfilm records, and maps.

The park's slide archive contains 90,000 images, and is used primarily by park interpreters and park partners in their program and research activities. The collection includes a wide variety of subjects such as scenic features, pictorials, physiography, animals, plants, ethnography, history, program aids, studies, and collections.

The archival collections contain original documents, unpublished manuscripts, and other materials that document the work of the National Park Service and the various park concessioners and the private and corporate papers of individuals and groups that are important to park history. This collection is extensively used by researchers.

Management Status

The overall condition of the collections is unsatisfactory, and the environmental conditions under which they are stored are, in most instances, well below standard for objects and materials of such value. They are subject to considerable risk. Attic and garage storage presents serious threats of both insect and animal damage, and environmental controls are either limited or absent. Roofs have leaked, and squirrels have shredded manuscripts.

Facilities are inadequate for collections management or maintenance. Public contact, office, and cataloging spaces are combined in all units. Facilities for public study and enjoyment are extremely limited, and there is no access for people with disabilities.

MODERN SETTING

Most visitor activity takes place in the east end of Yosemite Valley, where visitor accommodations, campgrounds, concessioner facilities, and the major NPS visitor and administrative facilities are located. Most of the affected facilities are in the Yosemite Lodge, Yosemite Village, Curry Village, Ahwahnee Hotel, campground, and stables areas.

Yosemite Village

Most development and day use in Yosemite Valley is in Yosemite Village. The village is about 1 mile east of Yosemite Lodge. The NPS visitor center, museum, administration building, maintenance area, and emergency services area are in the west end of the village along with the NPS housing area, where approximately 106 employees reside. The middle section of the village contains one full-service and several fast food restaurants as well as a grocery and general merchandise store, photo shop, and the administrative headquarters of the concessioner. The east end of the village contains concession housing for approximately 400 employees and

the Yosemite medical group, which includes a dental office.

Housing areas include the Yosemite Village historic district, Ahwahnee Row houses and apartments, lower Tecoya dorms and apartments, middle Tecoya, upper Tecoya, the Lost Arrow dorm, three cabins in the NPS maintenance area, a few apartments above the post office, and three older buildings between the Ansel Adams Gallery and the concessioner warehouse.

Ahwahnee Hotel

The concession's 121-room hotel complex, about 0.5 mile east of Yosemite Village, contains a large dining room, a gift shop, and two lounges. West of the hotel is an employee dormitory and three tent cabins for 45 concession employees.

Campgrounds

Many of the valley campsites are in the floodplain and influence river processes and riparian systems.

Stables

The concession operates a large horseback/guiding service with corrals, tack sheds, and horse barns northwest of Curry Village. Housing is provided primarily in tent cabins for approximately 40 employees.

Curry Village

Approximately 1 mile southeast of Yosemite Village is Curry Village. This area provides overnight accommodations in a low to moderate price range, including tent cabins, cabins, and a few lodge units. The village also provides food service, a rock climbing school, and raft rentals. Employee housing for approximately 350 concession employees is provided in the Terrace, Boys Town, and several scattered cabins and remodeled houses.

Housekeeping Camp

Accommodations consist of separate units with concrete walls with a double canvas roof and one canvas wall that separates a sleeping area from a covered cooking/dining area. Restrooms, a shower house, laundry, and general store are nearby.

INTERPRETATION

Yosemite's *General Management Plan* identified themes for interpretation and recreation in the park:

> There are two purposes for Yosemite National Park. The first is the preservation of the resources that contribute to Yosemite's uniqueness and attractiveness — its exquisite scenic beauty; outstanding wilderness values; a nearly full diversity of Sierra Nevada environments, including the very special sequoia groves; the awesome domes, valleys, polished granites, and other evidences of the geologic processes that formed the Sierra Nevada; historic resources, especially those relating to the beginnings of a national conservation ethic; and evidences of the Indians who lived on the land. The second purpose is to make the varied resources of Yosemite available to people for their individual enjoyment, education, and recreation, now and in the future.

Information

When visitors enter Yosemite they are given a park folder and newspaper that contain maps and information about developed areas and facilities and safety and protection guidelines. Small visitor contact stations are open for additional orientation during normal business hours (seasonally) close to all but the Arch Rock entrances. Once in Yosemite Valley, day use visitors are directed by signs to a parking area near Curry Village where they can board a free shuttle bus to principal east valley features and facilities, including the park's only visitor center. Overnight guests often proceed directly to their lodgings or campgrounds where they find varying levels of orientation. Visitors arriving on commercial bus tours make a limited number of stops and rely mostly on their commercial tour guides for orientation and interpretation.

Interpretive Facilities

Interpretive facilities in Yosemite Valley are located primarily in Yosemite Village where a visitor center has exhibits on park resources. There are two auditoriums in the building, where an audiovisual program is shown for orientation and education. The auditoriums are also used for interpretive theatrical programs. There is a bookstore in the visitor center where maps, books, tour guides, pamphlets, tapes, records, CDs, and posters are available for purchase. Restrooms are nearby.

The Yosemite museum exhibits interpret the story of American Indian culture in a permanent gallery with crafts and demonstrations. Yosemite-related art and exhibits featuring objects from the museum collection are presented in a changing gallery. The facility also has craft demonstrations and interpretive talks by American Indians. A small desk in the lobby of the museum sells publications and American Indian crafts. The park's research library and archive are also in this building as are a portion of the museum's collections. These facilities are open to visitors.

The Indian Village of Ahwahnee is behind the museum. It consists of a self-guided walk through a variety of reproduced structures and outdoor exhibits that depict the traditional lifestyle of Yosemite Valley's American Indian occupants.

The nearby cemetery has a self-guiding trail.

A historic building has been rehabilitated to serve as a wilderness center. Wilderness permits are issued, and guidance for wilderness use is provided. There is also a post office and a variety of shops offering fine arts, gifts, souvenirs, photographic supplies, groceries, and

clothing. There is a food service facility on the mall, where fast food, deli, and restaurant service is available.

Many guided walks originate near the visitor center. The valley floor tour, a concession-operated bus tour, originates on the mall. Its route circles the valley floor, providing interpretation and orientation. There are many wayside exhibits and self-guiding trails throughout the valley.

The Yosemite Lodge offers some interpretation in a multipurpose room. There are amphitheaters at Lower Pines Campground, Yosemite Lodge, and in Curry Village where interpreter-led programs are held during the summer. Interpretive programs at the Ahwahnee Hotel are provided in the lobby and on the patio. A small informational display is also located in the hotel.

A mountaineering shop and school at Curry Village provides instruction and guide service and equipment for rock climbers.

The nature center at Happy Isles is open seasonally. It offers natural history exhibits designed for family and children's groups, junior ranger programs, a bookstore, and a starting point for interpretive nature walks.

The LeConte Memorial Lodge, operated by the Sierra Club and open during the summer, has a library for public use as well as occasional lectures and other programs.

Overall, a wide variety of interpretive programs are offered in Yosemite Valley: interpreter-led walks on history and natural history, cultural demonstrations in the Yosemite museum and the Indian Village of Ahwahnee, short interpretive programs at high use areas such as Yosemite Falls, evening amphitheater programs, the Yosemite Theater productions, the concession-operated valley floor tour, an orientation slide program, photography walks (concession operated), living history walks, films, junior ranger programs, formal education programs (NPS and Yosemite Institute), and art activity center programs.

RECREATION

Passive, social, and active recreational pursuits abound in Yosemite Valley. Some activities are directly dependent on the attributes of the valley and others could be experienced anywhere. Almost all activities are made more memorable by the environment of the valley. Data is not available on the specific conditions and social qualities that visitors seek, but it is believed that most recreational activities in the park would be diminished by crowding and structured landscapes.

The ability to sit or stand quietly, absorbed in thought or in awe of one of Yosemite's majestic views, is basic to the park experience. Artistic pursuits are also fundamental to the enjoyment of Yosemite Valley, which provides inspiration for artistic expression. Bird and animal observation and nature study are popular and require intact ecosystems. Quiet and solitude enhance this activity. Archeological, historical, and cultural landscapes can be better understood with the use of written interpretive materials, well designed interpretive displays, and museum displays.

Auto and bus touring are common ways of exploring and enjoying Yosemite Valley and require a safe and efficient road system. The number of sites accessible by auto and bus are limited, and the noises, sights, and crowds associated with popular roadside attractions affect the visitor's experience.

Camping takes place in a campground near many other people. There are a variety of camping experiences, ranging from recreational vehicle camping to car/tent camping, to walk-in/tent camping. Sometimes sites have to be shared with several other parties. Areas adjacent to campgrounds with natural or social attractions draw people.

Shade in the summer and a warm, sunny area in the winter combined with some combination of inspiring views are common attributes of favored picnic sites. While some people access picnic areas with backpacks, most rely on

automobiles to transport families, food, and paraphernalia. Frequently, picnic sites become a base for exploring the park.

Walking and hiking are popular. Hikers carry food and water and cover a longer distance than the average walker. A typical hike in Yosemite Valley can involve considerable elevation gain. Some of the more strenuous hikes, such as to the top of Half Dome or El Capitan, can require 8–16 hours or longer. On longer hikes, less crowding and a larger number of pristine and inspiring views may be desired. Jogging and running can be done most anywhere in Yosemite Valley. The backpacker is prepared for overnight stays in the backcountry. Although the first or last night may be spent in Yosemite Valley, the focus of a backpacking trip is usually beyond.

Climbing in Yosemite Valley includes wilderness/adventure climbing, traditional climbing, big wall climbing, recreational climbing, sport climbing, speed climbing, bouldering, big drop rappelling, and free solo climbing.

Kayaks are occasionally used on the river, but most kayakers enjoy swifter, more challenging stretches outside of Yosemite Valley. Fishing requires a state license (available at several locations in the park) and is popular. Solitude and quiet in a natural setting are often sought by anglers.

Immediately after cold winter storms, cross-country skiing in Yosemite Valley is very popular. Snowmelt from trees on the sunny north side of the valley can make skiing unpleasant for several days after a storm. However, during extended cold periods when snow lingers, especially on the shady south side of the valley, cross-country skiing is pleasant for some time. Because of the dense forest covering much of the valley floor, most ski routes follow summer trails or traverse the valley's open meadows. The valley sometimes has little or no snow for long periods.

Swimming in the Merced River, Tenaya Creek, and Mirror Lake is very popular in the summer. Most sections of river with easy access from lodging areas, campgrounds, picnic areas, and roadside pullouts are used. There are swimming pools at Yosemite Lodge and Curry Village.

Bicycling is a common means of enjoying and exploring Yosemite Valley. While many visitors bring bikes, many more are dependent on rentals. Bicycles are required to use paved paths and roads. Horseback riding has been a traditional use from the earliest history of the park and requires a system of equestrian trails. There is the possibility of conflict in the use of trail and road systems with walkers, hikers, bicyclists, and motor vehicles.

SCENIC AND RECREATIONAL RIVER VALUES

In 1987 Congress placed approximately 71 miles of the main stem of the Merced River (from its headwaters near Mt. Lyell to Bear Creek near Briceburg) under the protection of the Wild and Scenic Rivers Act. This legislation directs the agency responsible for managing the given segments of a designated river to identify the "outstandingly remarkable values" of the segments and to protect those values.

The Merced River, as it flows through Yosemite Valley from the wilderness boundary at the top of Nevada Falls to the diversion dam near the intersection of the El Portal Road and the Big Oak Flat Road, has been classified as scenic. The corridor managed through Yosemite Valley includes the 100-year floodplain, all wetlands and meadows, and a belt along the major waterfalls.

The scenic outstandingly remarkable values include:

- views of all the Yosemite Valley and Merced Gorge waterfalls, rock cliffs, meadows, and black oak woodlands
- the scenic interface of river, rock, meadow, and forest

- views of 11 "most important" scenic features identified in the *General Management Plan*

The geologic outstandingly remarkable values include:

- the largest glaciated valley in the Sierra Nevada
- hanging valleys at Bridalveil, Illilouette, and Yosemite Creeks
- the terminal moraine below El Capitan meadow and medial moraines in the east end of the valley
- outstanding examples of exfoliation at Royal Arches and North Dome
- the transition from a characteristic U-shaped, glaciated valley to a V-shaped river gorge

Air quality outstandingly remarkable values include:

- mandatory class I airshed under the Clean Air Act (the most protective classification), which allows only small amounts of certain pollutants

The recreational outstandingly remarkable values include:

- hiking, picnicking, camping, climbing, skiing, fishing, photography, swimming, nature study, horseback riding, biking, and sightseeing

The biological outstandingly remarkable values include:

- contains 50% of all plant species in the park
- riparian areas and low elevation meadows that are the most biologically productive communities in the valley
- exceptional stands of large California black oak for the Sierra Nevada
- rich wildlife habitat; significant species include neotropical migrants, peregrine falcons, spotted owl, golden eagles, 17 possible bat species (eight of which were federal candidates)
- rare indigenous rainbow trout population.

The cultural outstandingly remarkable values include:

- over 100 archeological sites
- primary habitation of prehistoric people; many traditional use plants; Nevada Falls is a documented American Indian spiritual area
- significant prehistoric trail junction
- first land area and river to be designated for preservation in the United States

The outstandingly remarkable hydrological values include:

- gradients
- a high degree of geomorphic diversity, such as oxbows, stream bars, levees, low-lying wetlands, and riparian meadows

SOCIOECONOMICS

Each year, several million people visit Yosemite National Park. These visitors spend millions of dollars on lodging, food and beverages, transportation, and other items while in the area. Much of this spending is inside Yosemite National Park, but a major portion of Yosemite-related expenditures are made outside the park. As a result, Yosemite visitor spending is an important source of income and employment for many of the small communities nearby. The current economic conditions in the local counties have been examined in order to determine the effects of tourism spending (and more specifically Yosemite tourism spending).

Average visitor spending estimates are an important factor in the analysis of the local county economies. Spending estimates for each of the three categories of Yosemite visitors have been determined: (1) visitors who spend the night in the park (park overnighters), (2) visitors who spend the night outside, but near the park (local overnighters), and (3) visitors who come

to the area for day use only and do not stay in the region overnight (day excursion visitors).

The economic effects of visitor spending on the counties surrounding the park are related to the underlying structure of each county's economy. Counties with a large number of tourism-related businesses are more affected by changes in traveler and tourism spending than counties where traveler and tourism-dependent businesses comprise a small component of the economy. In order to assess the importance of tourism to the region, economic and statistical profiles were developed for each county surrounding the park. Each profile provides detailed information on the size of that county's principal economic sectors in terms of output, income, employment, and other relevant economic indicators. These profiles establish an economic baseline that can be used to evaluate the importance of expected VIP-related changes in aggregate visitor spending in the region.

Identification of the Affected Region

Yosemite National Park borders Madera, Mariposa, Mono, and Tuolumne Counties. Almost all of the concession facilities in the park operate under the jurisdiction of Mariposa County.

Road access and proximity to Yosemite Valley were measured from major cities in central California to identify the counties to be included in the socioeconomic impacts analysis. Table 19 provides driving distances and estimated driving times between major cities in the Central Valley and the park. Average travel speed factors were used on road distances and road types to develop travel time estimates. The driving time estimates do not account for the actual road and driving conditions to Yosemite, so these figures are low estimates due to weather conditions, road gradients, traffic congestion, and delays caused by rockslides.

TABLE 19: TRAVEL DISTANCES AND AVERAGE TRAVEL TIMES FROM YOSEMITE VALLEY

Town/City	County	Road Distance	Estimated Travel Time[1]
NORTH via Route 120			
Groveland	Tuolumne	50	0:54
Big Oak Flat	Tuolumne	52	0:55
Sonora	Tuolumne	75	1:26
Oakdale	Stanislaus	95	1:53
Modesto	Stanislaus	107	2:16
Manteca	San Joaquin	115	2:07
Stockton	San Joaquin	129	2:25
WEST via Route 140			
El Portal	Mariposa	14	0:42
Mariposa	Mariposa	44	1:08
Merced	Merced	83	1:51
Turlock	Stanislaus	105	2:17
SOUTH via Route 41			
Fishcamp	Mariposa	29	1:10
Oakhurst	Madera	41	1:23
Madera	Madera	82	2:18
Fresno	Fresno	89	2:22
EAST via Route 120			
Lee Vining	Mono	71	1:15
Bridgeport	Mono	96	1:41
Bishop	Mono	136	2:27
June Lake	Mono	90	2:15
Mammoth Lakes	Mono	106	2:30

Sources: The National Park Service and Dornbusch & Company.

1. These travel time estimates do not include adjustments for traffic congestion, road gradients, or turns that could reduce average travel speeds.

Cities more than 100 miles or 2.5 hours driving time from the park were excluded from the impact analysis. Travel and lodging expenditures made by travelers within the 100-mile radius of the valley are likely to be Yosemite-related since the park is the dominant tourist destination in the region.

In addition to the four counties mentioned, Merced County is also often considered a gateway. The city of Merced is at the junction of Route 140 (El Portal entrance) and Route 99, which is a major highway through the central valley. There is a significant flow of visitor traffic along Highway 140. Some travelers prefer to enter Yosemite by this route since it avoids most of the high country.

Two other cities on the primary access routes to Yosemite, Fresno, and Oakdale (in Stanislaus county), were excluded from the socioeconomic impact analysis because it is difficult to distinguish the portions of the Stanislaus and Fresno tourist economies that are solely associated with Yosemite visitation and not with other tourist destinations such as Sequoia and Kings Canyon National Parks or Sonora and the gold country. Also, tourism is a relatively small component of the counties' overall economies.

For the purposes of this analysis the affected region is defined as the five-county area of Madera, Mariposa, Merced, Mono, and Tuolumne Counties.

Methodology

A socioeconomic profile was prepared for the affected region. The socioeconomic profile provides a general characterization of recent demographic, infrastructural, and economic conditions in the Yosemite region and presents the baseline statistics to be used in the impact analysis of the alternatives. The baseline serves as a measure of the size of the region's socioeconomy and is used to evaluate the magnitude of potential impacts on those counties from changes in park visitation.

Baseline Socioeconomic Conditions

Unless noted otherwise, all figures are presented in 1997 dollars to facilitate comparisons between statistics. When necessary, the figures were adjusted into 1997 dollars using the U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI) for All Urban Consumers (CPI-U, 1982-84=100).

The primary data source used to compile the economic baseline was IMPLAN, which is an economic model that estimates the effects on a specific economy from changes in spending. Micro IMPLAN Group (MIG) provides county-specific data on output, income, employment, and other economic variables as part of its input-output system. For information that is not provided by IMPLAN, such as forecasting employment trends, population, and taxable sales, other data was used.

General Overview of Counties

Madera County. The central economic activity in Madera County is agriculture, which comprises nearly 33% of the county's total employment. The agricultural sector stimulates production in related sectors of the economy, including jobs in food processing, transportation, and wholesale trade (EDD 1995). According to the Micro IMPLAN Group, there were 39,085 jobs in Madera County in 1993. The agricultural sector is the largest employer in the county, accounting for 22.9% of employment. The second largest sector in Madera County is the service sector, accounting for 19.7% of employment. The other important economic sectors in Madera are government (14.9%), retail trade (13.7%), manufacturing (10.6%), and construction (7.0%).

Mariposa County. Recreation and tourism are the major industries in Mariposa County. These two industries account for the majority of the income and employment in Mariposa County. For example, 47% of employment in Mariposa is in the service sector. Yosemite National Park is the county's primary tourist attraction. Most

of Yosemite National Park is in Mariposa County, as are parts of Stanislaus and Sierra National Forests. Lodging, food and beverage, and retail trade businesses are central to the county's economy (EDD 1993). The importance of the lodging, food, and beverage economy is shown by the large proportion of the economy in the service and retail sectors.

The service industry is the largest employer in Mariposa, followed by government (30%) and wholesale and retail trade (12.5%). Other industries, such as manufacturing (4%) and construction (3.5%), are limited. It is forecasted that nonagricultural wage and salary employment in Mariposa County will increase by 6% from 1992–1998. This is a projected increase of 300 jobs — from 4,975 in 1992 to 5,275 in 1998. Over half of this growth is expected to be in the service industry. Yosemite National Park is expected to provide the main catalyst for job growth, primarily in the recreation and tourism sector and in health services. Wholesale and retail trade is expected to add 50 new jobs in the county, primarily in food stores, gas stations, and eating and drinking establishments. By 2000 it is projected that the trade sector will surpass the government sector as the second largest industry in Mariposa County (EDD 1993).

Merced County. Merced County has the largest economy in the affected region. Merced County's economy is primarily agricultural; over 90 different crops are commercially produced in the county. The primary commodities are milk and milk products. Chicken and cattle are important agricultural commodities. The economy has a light industry component, but much of it is geared toward agricultural products.

Recreational resources in Merced County include Lake McSwain, Barrett Cove, and Lake McClure, where camping is available. The primary tourist attraction, particularly for the city of Merced, is Yosemite National Park, which is just beyond the county's eastern boundary.

The EDD forecast was for a 6% increase in industry employment in Merced from 1992 to 1998. The government sector is currently the largest employer in Merced, accounting for 22.6% of wage and salary employment. The other principal employers in the county are agricultural production (17.4%), manufacturing (16.2%), retail trade (16.2%), and service (13.0%). Other industries, such the finance, insurance, and real estate sector (4.2%) and the wholesale trade sector (3.7%), account for little of the employment in the county.

Education-related employment accounts for most of the jobs in the government sector. From 1992–1998 agricultural employment was predicted to increase by 15% to a total of 10,500 jobs. Total nonagricultural employment was predicted to increase by 6%, from 46,750 in 1992 to 49,550 in 1998. Sizable employment increases are also expected in retail trade, manufacturing, and government. Employment in the construction sector and the transportation and public utilities sector is expected to decrease.

Mono County. Mono County's largest employers are the service sector and retail trade, both of which are bolstered by extensive natural resources and recreational opportunities. Mammoth Lakes, which is in the southern part of Mono County and is the center of its winter sports activities, is the fastest growing community in the county.

Economic data for Mono and Inyo Counties are reported together. Due to the similarities of the two counties' economies, the figures reported for both counties are a fair representation of Mono County alone. The service sector is the largest and accounts for approximately 34% of nonagricultural jobs. Employment is erratic because it depends on snowfall at one of the largest ski resorts in the western United States. Employment is expected to decline by 3% in the service sector from 1992–1998. The retail trade sector is the second largest employment sector in Mono County, accounting for 25% of employment; it is also a general gauge of the Mono County economy and was predicted to experience 3% growth over the 1992–1998 period. The government sector follows at 24%. Other industries have very limited employment.

Tuolumne County. The government, service, and retail trade sectors are the largest sectors in Tuolumne County. Yosemite National Park is in the southeastern sector of the county. Columbia State Park, Stanislaus National Forest, Dodge Ridge Ski Area, and Leland Meadows are among the many state and federal parks and recreational areas in the county.

The government sector, accounting for 27.4% of employment, is the largest employer in Tuolumne County, followed by service (23.6%), retail trade (22.9%), manufacturing (7.9%), and mining and construction (7.5%). Other sectors, such as finance (5.2%), wholesale trade (1.9%), and agriculture (0.7%), employ few individuals in Tuolumne County.

Moderate growth was predicted in employment from 1992–1998 in Tuolumne County. Most sectors of the economy will experience growth, with the largest growth projected in the service, retail trade, and government sectors. The service sector is expected to produce the most new jobs, primarily in the area of health and recreational services, responding to the county's rapid population growth and increased tourism. Retail trade accounts for the second largest increase in new jobs, driven largely by an increased demand for consumer goods (EDD 1994).

Population

The total population of the affected region in 1993 was approximately 373,000. Merced County, with approximately 192,600 residents, is the most populated county. Mono County has the smallest population (approximately 10,200) despite having the greatest land area of the five counties. Table 20 provides population figures for the five counties in the affected region.

TABLE 20: POPULATION BY COUNTY

County	Population 1995
Madera	109,500
Mariposa	16,550
Merced	202,800
Mono	11,250
Tuolumne	53,300
Total	**393,400**

Source: Department of Finance

The populations of all five counties are predicted to grow steadily through 2040 (see table 21). Madera County was forecast to grow by almost 50% during the 1990s. Mono County is predicted to experience the least growth for the decade at just under 20%. The per-decade rate of population growth is expected to steadily decline for all the affected counties except Mono, which is forecasted to increase during the first decade of the 21st century before declining.

Income. Total personal income includes wages and salaries, proprietor's income, interest and dividends, and transfer payments. In 1993 the total personal income for the five-county area was approximately $5.8 billion (1995 dollars) (see table 22).

Employment. The employment figures include all waged, salaried, and self-employed jobs in each county. The employment estimates include both full-time and part-time workers. In 1993 total employment was approximately 153,000 for the five-county area. Approximately 51% of the total employment in the affected region was in Merced County alone (MIG 1995). Table 23 provides total employment estimates for the

TABLE 21: COUNTY POPULATION PROJECTIONS, 1990–2040

County	1990	2000	2010	2020	2030	2040
Madera	89,800	134,000	171,800	214,100	262,900	317,900
Mariposa	14,500	20,100	24,900	29,600	34,200	38,700
Merced	180,600	239,000	313,600	401,900	506,300	626,900
Mono	10,200	12,200	15,300	18,700	22,200	25,800
Tuolumne	49,000	65,800	81,200	97,100	113,400	130,100
Total	344,100	471,000	606,800	761,400	939,000	1,139,400

Sources: "Projected Total Population of California Counties: 1990 to 2040," Report 93 P-3, State of California, May 1993, and Dornbusch & Company.

TABLE 22: 1993 INCOME BY MAJOR INDUSTRY (IN MILLIONS OF 1995 DOLLARS)

Industry Sector	Madera	Mariposa	Merced	Mono	Tuolumne	Total
Total	**$1,455.7**	**$262.8**	**$3,014.3**	**$282.8**	**$818.1**	**5,833.7**
Agriculture	235.3	19.3	495.7	8.4	25.5	784.2
Mining	4.4	0.5	n/a	0.9	44.2	49.9
Construction	122.2	21.5	157.3	42.0	92.8	435.7
Manufacturing	269.2	12.2	479.8	1.5	85.2	847.8
Transportation, public utilities	95.7	8.1	189.1	11.4	46.6	351.0
Wholesale trade	38.1	5.0	108.2	5.0	33.8	190.3
Retail trade	105.7	15.3	196.2	35.5	82.4	435.0
Finance, insurance, real estate	139.8	24.9	313.5	35.9	104.8	618.8
Services	243.5	101.7	393.6	97.2	176.8	1,012.9
Government	201.8	54.4	680.8	45.1	126.1	1,108.1

Sources: Micro Implan Group (MIG), Input-Output System – IMPLAN, as compiled by George Goldman, Department of Agricultural and Resource Economics, University of California at Berkeley and Dornbusch & Company. Totals may not add up exactly due to rounding.

TABLE 23: EMPLOYMENT BY MAJOR INDUSTRY

Industry Sector	Madera	Mariposa	Merced	Mono	Tuolumne	Total
Total	**39,085**	**7,117**	**78,886**	**7,758**	**20,590**	**153,436**
Agriculture	8,954	345	13,913	150	548	23,910
Mining	54	8	n/a	10	379	451
Construction	2,743	505	3,578	884	2,070	9,780
Manufacturing	4,157	293	9,863	55	1,431	15,799
Transportation, public utilities	1,807	204	4,164	202	908	7,285
Wholesale trade	1,040	129	2,879	133	611	4,792
Retail Trade	5,334	855	9,987	1,773	4,085	22,034
Finance, insurance, real estate	1,486	249	3,661	549	1,445	7,390
Services	7,690	2,988	12,394	2,838	5,775	31,685
Government	5,821	1,542	18,447	1,163	3,338	30,311

Sources: Micro Implan Group (MIG), Input-Output System - IMPLAN, as compiled by George Goldman, Department of Agricultural and Resource Economics, University of California at Berkeley and Dornbusch & Company. Totals may not add up exactly due to rounding.

counties by sector. The figures are used as the baseline for the employment conditions.

According to census estimates, the total civilian labor force of the five-county region in 1993 was 167,000, of which approximately 143,000 were employed. All five counties have unemployment rates that are above the national and state averages. The region's average rate of unemployment in 1993 was 14.4%.

Output. Economic output is a measure of productivity. Output is measured differently depending on the type of goods in question. For the agricultural sector, output is measured by the value of the products sold. In the manufacturing sector, output is a measure of the value added by the manufacturer or the value of shipments. In the wholesale trade and retail trade sectors, output is the value of sales. In the service sector, output is measured as receipts in dollars.

The estimated total output of goods and services for the five counties in 1993 was almost $11.7 billion (1997 dollars). Merced County's output represents over half this total at approximately $6.2 billion (1997 dollars). Mono County's population and civilian labor force are smaller than Mariposa County's, but Mono County's output was higher in 1993 — $480 million compared to $415 million (1995 dollars; see table 24). For all counties, the services sector is the largest economic sector according to output.

The output figures for the four travel-related sectors were compared to the employment figures. Table 25 presents the comparison of expenditures by sector. Travel-related expenditures are a measure of total purchases by travelers, including taxes. The IMPLAN data was sorted to include only travel-related industries. The total output of sectors associated with tourism spending were estimated to be over $1.2 billion (1997 dollars). The lodging sector was the largest sector associated with traveler services in 1993 in Mariposa and Mono Counties. In Mariposa County the receipts in the lodging sector were nearly 80% of the total output of all the travel service sectors combined. In Mono County lodging receipts accounted for nearly 60% of the output of all four sectors. or Madera, Merced, and Tuolumne Counties, the largest sector associated with traveler services is the food and beverages sector. In Madera and Merced Counties, the value of sales from the food and beverages sector is approximately 41.7% and 46.6%, respectively, of the total output of all the sectors combined. For Tuolumne County, the food and beverages sector comprises 39% of the total output of all four sectors. These figures represent the total spending in the county on these services, so the spending by county residents on groceries are included. Similarly, the retail and transportation output figures include a major portion of resident spending on goods and services in those sectors.

TABLE 24: 1993 INDUSTRY OUTPUT BY COUNTY BY SECTOR

Industry Sector	Madera	Mariposa	Merced	Mono	Tuolumne	Total
Total	**$3,091.7**	**$415.1**	**$6,218.0**	**$480.1**	**$1,534.1**	**$11,738.8**
Agriculture	657.7	25.4	120.5	15.8	40.0	1,903.3
Mining	14.3	1.6		1.6	85.0	102.3
Construction	338.1	61.0	436.0	113.5	252.5	1,201.7
Retail	80.9	8.1	133.7	17.2	66.8	306.8
Services	689.3	188.6	1,241.4	201.4	493.9	2,814.6
Government	204.2	55.0	712.4	45.3	131.3	1,148.4
Other	1,107.2	75.4	3,574	85.3	464.6	5,307.3

Sources: Micro Implan Group (MIG), Input-Output System – IMPLAN, George Goldman, Department of Agricultural and Resource Economics, University of California Berkeley and Dornbusch & Company. Totals may not add up due to rounding.

TABLE 25: COMPARISON OF EXPENDITURES BY SECTOR (IN MILLIONS OF 1997 DOLLARS)

Industry Sector	Madera	Mariposa	Merced	Mono	Tuolumne	Total
Total	$234.8	$237.8	$432.6	$156.9	$185.7	$1,247.8
Lodging	18.2	104.8	10.5	88.1	17.6	239.3
Food, beverage	97.8	123.2	201.8	44.6	72.4	539.7
Retail	69.1	5.6	101.4	17.3	72.0	265.5
Transportation	49.7	4.2	118.8	7.0	23.7	203.4

Sources: Micro Implan Group (MIG), Input-Output System – IMPLAN, as compiled by George Goldman, Department of Agricultural and Resource Economics, University of California at Berkeley and Dornbusch & Company. Totals may not add up exactly due to rounding.

Taxable Sales. For examining annual spending in the travel-service sectors, taxable retail sales are good indicators, because they only include the taxes paid for transactions with consumers. The total taxable sales figures include the taxes paid by businesses on raw materials and services. The total taxable retail sales for the five counties in 1993 totaled $1.65 billion. The industry output in 1993 was nearly $3 billion for the combined retail sector ($294 million) and service sector ($2.7 billion). Taxable retail sales are a portion of the output of the retail and service sectors in the region.

TABLE 26: TOTAL TAXABLE SALES BY COUNTY (IN MILLIONS OF 1997 DOLLARS)

County	1994	1993	1992
Total	$2,594.6	$2,519.2	$2,539.3
Madera	703.0	678.5	687.0
Mariposa	126.6	128.5	137.6
Merced	1,254.5	1,194.9	1,191.7
Mono	131.3	141.5	134.9
Tuolumne	379.2	375.8	388.0

Sources: "Taxable Sales in California (Sales and Use Tax)," California State Board of Equalization, 1992-1994, and Dornbusch & Company. Totals may not add up exactly due to rounding.

Note: All figures were indexed to current dollar terms using the U.S. Department of Labor All Items Consumer Price Index for All Urban Consumers (CPI-U), 1982-84=100.

Between 1992 and 1994 taxable retail sales in Madera, Mariposa, and Mono Counties declined slightly, while increasing in Merced and Tuolumne Counties for this three-year period. Merced County experienced the biggest increase, which was 11% in nominal dollars. See table 26 for taxable retail and total sales by county for 1992–1994.

BASELINE SOCIOECONOMIC PROFILE OF THE AFFECTED VISITOR POPULATION

Yosemite Visitor Trip Characteristics

The trip characteristics of Yosemite's visitors are important in determining the socioeconomic the combined retail sector ($294 million) and service sector ($2.7 billion). Taxable retail sales are a portion of the output of the retail and service sectors in the region.

Between 1992 and 1994 taxable retail sales in Madera, Mariposa, and Mono Counties declined slightly, while increasing in Merced and Tuolumne Counties. For this three-year period Merced County experienced the biggest increase, which was 11% in nominal dollars. Between 1992 and 1994 taxable retail sales in Madera, Mariposa, and Mono Counties declined slightly, while increasing in Merced and Tuolumne Counties. For this three-year period Merced County experienced the biggest increase, which was 11% in nominal dollars. See table 26 for by-county taxable retail and total sales for 1992–1994.

Visitors' trip behavior affects how and where socioeconomic impacts occur. The following analysis discusses the principal aspects of visitor trip behavior that influence the socioeconomic impacts of annual visitation to Yosemite. Table 27 summarizes this information.

Visitor Population Categories

Overnight visitation in the park is controlled by the National Park Service and limited by the availability of lodging and camping facilities. For day use visitors to the valley, the *General Management Plan* set a specific limit of 10,530 visitors at any one time. The day use population consists of two categories. First, there are those visitors who stay overnight locally outside of the park as part of their visit to Yosemite. These visitors typically spend several days visiting the park and are referred to as "local overnighters." Second, there are park visitors who do not spend the night in the park or in the surrounding local counties. Typically, these visitors spend only one day in Yosemite before leaving the region to spend the night at home or in lodging outside the area. "Day users" or "day use visitors" are terms used interchangeably in the analysis. The day use visitor population is comprised of both local overnighters and day excursion visitors. Visitors who spend the night in the park are referred to as "park overnighters." Some visitors fall into two categories. For example, some visitors spend nights both inside and outside the park during their trip to Yosemite. Distinct visitor population estimates were developed to account for these overlaps. Another central distinction is between visitors who stay overnight outside the park in the affected region and visitors who lodge outside of the affected region (such as in San Francisco or Lake Tahoe). Visitors lodging outside of the affected region were categorized as day excursion visitors. Based on the limited available visitation information, it is estimated that park overnighters account for about 20%, local overnighters for 30%, and day users for 50% of the park visitor population.

Park Visitation Trends

Estimates of total annual visitation to Yosemite were developed from the NPS monthly public use reports. The analysis indicates that over the last 15 years, the number of individuals visiting Yosemite National Park increased at an average annual rate of 3.3%. More recently, the rate of growth in visitation has been even higher, determine trends in overnight and day use visitation (applying Gramann's findings on length of stay). This analysis revealed that growth has been driven entirely by increased day use. Between 1981 and 1995, overnight visitation to Yosemite effectively remained unchanged (+0.2%) while day user visitation grew by an average of 4.5% annually. Over the last few years (1990 to 1995) overnight visitation changed little (-0.7%), while day user visitation grew by 6.2% per year. These figures not only show that demand for Yosemite visitation is strong and growing, but that the park's limited lodging has increasingly forced individuals to visit as day users. A significant share of the growth in day use visitation can be attributed to increases in local overnighter visitation as evidenced by the corresponding growth in the affected region's lodging and other visitor services.

Lodging Outside Yosemite National Park for Auto Travelers

Approximately 49.5% of peak season auto travelers who lodge outside of the park stay in Madera, Mariposa, Merced, Mono, and Tuolumne Counties. The remaining 50.5% lodged in other areas outside the region (Gramann 1992; see table 27).

Length of Stay

The length of stay of the visiting population is important in determining the magnitude of visitor impacts on the park, the concessioner, and the surrounding counties. Given the different behaviors of the visitor population categories, it is important to determine lengths of stay for each population category.

TABLE 27: PEAK SEASON AUTO TRAVELERS' LODGING LOCATIONS OUTSIDE YOSEMITE

County	Lodging outside Yosemite
Affected Region	
Madera	6.8%
Mariposa	17.0%
Merced	4.3%
Mono	19.9%
Tuolumne	1.5%
Total[1]	**49.5%**
Outside Region	
San Francisco	8.0%
Lake Tahoe area	6.2%
Los Angeles	2.5%
Other areas	33.8%
Total[2]	50.5%

Source: *Visitors, Alternative Futures, and Recreational Displacement at Yosemite National Park*, by J. H. Gramann, Texas A&M University, January 1992.

1. This figure represents the proportion of summer automobile passengers that lodged outside of Yosemite in one of the local counties during their trip. It may include visitors that also stayed inside the park.

2.This figure represents the proportion of summer auto passengers that did not lodge in one of the local counties. This figure may include both excursion visitors and visitors that stayed only in the park. These proportions only represent whether visitors stayed overnight in the local counties and not the length of time that they stayed there. The lodging location information was used to adjust the visitation estimates for the three visitor populations.

An average length of stay for both local and park overnighters of 2.7 days was used in the analysis. This approach assumes that local overnighters stay approximately the same length of time in the affected region as in-park overnighters. An average length of stay of 4.2 hours was used for day excursion visitors.

Visitor Use by Category

The visitor population estimates indicate the proportions of each visitor type (park overnighter, local overnighter, day excursion visitor) out of the total number of individuals visiting the park. The visitor population estimates do not reflect the visitation time and the intensity of park use by different visitor categories. Therefore, time per visitor is combined with visitor proportions to estimate the magnitude of impact. For example, a typical park overnighter staying in the park for 2.7 days has more impact than a day excursion visitor visiting for only 4.2 hours. The average length of stay information was combined with its respective visitor category to determine the intensity of park use by each visitor category. Based on visitor proportions and the length of stay data, park overnighters account for 43.5%, local overnighters account for 46.2%, and day excursion visitors account for 10.3% of visitor days in the park.

Average Daily Per Capita Expenditures

Tourist spending information from several different sources was analyzed to determine the average daily per capita spending by Yosemite visitors. The information was used to estimate the average spending by each of the three visitor categories.

The average total spending by each visitor group was based on the estimate of average daily per capita spending in the region of $55.10 for 1995 California visitors whose primary destination was a national park. This figure was obtained from Shifflet and Associates and adjusted for the impact analysis to $57.52. This has been used as the base spending figure for average daily spending by park overnighters. Based on the proportional spending relationships among the visitor population categories identified in the Gramann study, the local overnighter per capita daily spending is estimated to be $35.78 ($57.52 x 62.2%), and day excursion spending is $12.94.

Total Visitor Expenditures

Total Yosemite visitor spending was calculated in order to estimate the magnitude of the economic impact that Yosemite visitors have on the surrounding counties and the concessioner. The

daily visitor spending estimates are the primary source for estimating the annual total Yosemite visitation. Lower average daily spending figures would result in smaller aggregate economic impacts from visitor spending.Total spending by Yosemite visitors has also been estimated using the visitor spending estimates and distribution developed in the previous section. Total visitor spending in each visitor category has been estimated by multiplying the daily visitor spending estimates and the corresponding annual visitation (in visitor days). Visitor spending distribution estimates were used to apportion the spending according to the different traveler spending categories

Table 28 estimates total Yosemite visitor spending.Using these daily per capita spending figures and 1994 visitation levels, total Yosemite visitor spending is estimated to be $277.5 million (1997 dollars). This is equivalent to an average daily visitor spending of $36.18. This figure is only an estimate of visitor spending in Yosemite and the surrounding region. Yosemite visitors staying overnight outside the affected region are recognized as day excursion visitors. Spending by these visitors on lodging and other services outside the affected region are not included.

TABLE 28: AVERAGE SPENDING BY YOSEMITE VISITOR POPULATION (DAILY PER CAPITA SPENDING IN 1997 DOLLARS):

Visitor Type	Estimated Annual Yosemite Visitation (millions of visits)	Average Length of Stay in Region (days)	Average Total Daily Spending (per capita)	Total Spending (millions of $)
Total	**4.10**			**277.5**
Park overnighter	0.83	2.7	$57.50	128.9
Local overnighter	1.27	2.7	$35.78	122.7
Day excursion	2.00	1.0	$12.94	25.9

Sources: NPS monthly public use reports (1995) and Dornbusch & Company

TABLE 29: YOSEMITE NATIONAL PARK AUTO PASSENGER TRIP CHARACTERISTICS

Estimated proportion of total visitors	Park overnighters	20%
	Local overnighters	30%
	Day excursion visitors	50%
Average length of stay	Park overnighters	2.7 nights
	Local overnighters	2.7 nights
	Day excursion visitors	4.2 hours
Yosemite as a primary destination	Peak season	52.8%
	Off-peak season	76.8%
	California resident	68.1%
	Other U.S. resident	39.8%
	International visitor	26.2%
Yosemite as a multiple destination trip	Peak season	62.8%
	Off-peak season	41.7%
	California resident	45.7%
	Other U.S. resident	87.9%
	International visitor	97.3%
Repeat visitation	Peak season	56.1%
	Off-peak season	67.0%

Sources: Gramann, BRW, Inc., and Dornbusch & Company.



ENVIRONMENTAL CONSEQUENCES

DERIVATION OF IMPACT TOPICS

The National Environmental Policy Act calls for an examination of the impacts on all components of affected ecosystems. NPS policy is to protect the natural abundance and diversity of all of the park's naturally occurring communities. To provide a focus for environmental discussions and to ensure that alternatives are compared on the basis of the most relevant issues, the impact topics presented below were selected. Their inclusion was based on federal laws, regulations, and orders, NPS *Management Policies*, NPS analysis of limited or easily affected resources, and issues and concerns expressed during public scoping. A brief rationale for including particular topics follows.

NATURAL RESOURCES

Biotic Communities

Aquatic, Riparian, and Meadow Communities. Executive Order 11990, "Protection of Wetlands," requires an examination of impacts on wetlands, as well as alternatives to siting structures in wetland areas. Wetlands are critically important areas for the preservation of natural habitats and processes.

The riparian and meadow communities are ecologically important for many reasons, including their high degree of community and species-level biodiversity and provision of habitat for sensitive wildlife species.

Upland Communities. The upland communities contribute to the community and species-level biodiversity of the Yosemite Valley. These impact topics address all nonriparian communities.

Rare, Threatened, and Endangered Species. The Endangered Species Act requires an examination of impacts to all federally threatened or endangered species. NPS policy requires examination of the impacts to state-listed threatened or endangered species and species of concern.

Merced River Scenic and Recreational Values

In 1987 Congress designated the main stem and the South Fork of the Merced River under the Wild and Scenic Rivers Act. The section of the river through the valley has been designated as scenic. NPS policy requires impacts on these values to be examined.

Hydrology

This impact topic includes overall hydrologic and rivers/floodplains processes and interactions. NPS policy addresses the protection of natural ecological processes, including river processes. Executive Order 11988, "Floodplain Management," requires impacts on floodplains and potential risk involved in allowing development within floodplains to be examined.

Water Quality

The Clean Water Act requires the National Park Service, in implementing its management activities, to "comply with all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution in the same manner and to the same extent as any non government entity including the payment of reasonable service charges" (33 USC 1323).

Air Quality

The Clean Air Act requires federal land managers to protect park air quality, while NPS *Management Policies* calls for air resource management to be integrated into NPS operations and planning and for all air pollution sources in national parks to comply with all federal, state, and local air quality regulations. Because current and future air quality depends heavily on the actions of others, the National Park Service will

acquire the information needed to participate in decision making that affects park air quality.

Scenic Resources

Conserving the scenery of national park units was one of the fundamental purposes of the 1916 organic act, as well as a purpose of Yosemite National Park under its enabling legislation. Management options considered in this document could affect scenic resources.

Noise

Impacts related to noise, primarily from traffic in Yosemite Valley, have been identified by NPS staff and the public as an issue of concern. Therefore, noise impacts are addressed this document.

CULTURAL RESOURCES

The National Historic Preservation Act, the National Environmental Policy Act, NPS *Management Policies*, NPS-2 *Planning Process*, and NPS-28 *Cultural Resource Management Guideline* call for the consideration of historic and archeological resources in planning proposals. During the planning process, significant historic and archeological sites were identified that could be affected by the alternatives.

VISITOR USE AND INTERPRETATION

Providing for visitor enjoyment is one of the fundamental purposes of the National Park Service. Many management options considered in this plan would affect visitor use patterns and the type and quality of experiences.

SOCIOECONOMIC CONDITIONS

The National Environmental Policy Act requires an examination of socioeconomic impacts caused by management alternatives. The issue has also been raised during scoping.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. No alternative would have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's *Draft Environmental Justice Guidance* (July 1996).

WATER RIGHTS

The National Park Service has riparian, federal reserve, and groundwater rights that may be applicable to Yosemite Valley. The National Park Service generally has the same riparian rights as any other owner of riparian lands, so has riparian rights to (1) reasonable use of the Merced River, including the river's underflow, and (2) groundwater in known and definite channels. The National Park Service may or may not have federal reserved water rights for the purposes of Yosemite National Park (water necessary for preservation and retention of natural resources, accommodation of visitors, and protection against the destruction of fish and game). The National Park Service may also have rights to percolating groundwater in the case of wells.

The National Park Service can probably rely on riparian rights (to surface flow, underflow, and flow in known and definite underground channels), to percolating groundwater, or possibly federally reserved rights to support groundwater withdrawals for each alternative in the *Draft Valley Implementation Plan.*

Decreased water use in the valley, anticipated by each action alternative of the *Valley Implementation Plan*, should have no negative effect to these types of rights.

NATURAL ENVIRONMENT

The focus of this impact assessment is on the natural processes of Yosemite Valley, including size, physical foundation, and components of the natural communities and ecosystems. Quantitative analyses involved measurement of the areas currently disturbed by roads, structures, and other development and comparison with the size of areas proposed for ecological restoration or protection. Qualitative analysis was based on the assumptions listed below.

For purposes of this analysis the following relationships between key components of natural communities and impacts were assumed:

The greater the size of a biotic community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes. Development limits the size of a community and fragments and disassociates communities from each other.

The more developed areas become, the less valuable they are as wildlife habitat. New development would increase human presence and increase the potential for soil, wildlife, and vegetation disturbance. The potential for negative wildlife interactions (such as human injury from wildlife and the introduction of unnatural food sources) would also increase. The removal of development from an area would increase the value of the habitat. This value to individual species is, however, influenced by the home ranges of those species. For instance, the removal and restoration of a 10-acre parking lot in the middle of a developed area would increase habitat for small rodents but would not contribute to black bear or mountain lion habitat.

The effects of human food on the behavior, distribution, and abundance of wildlife species would continue in existing developments and would begin in new developments unless adequate facilities, education, and enforcement are provided. Levels of overnight use in Yosemite Valley are essentially the same in all alternatives, so the current high levels of human/bear conflicts would continue unless improved mitigation is provided.

The juxtaposition of natural communities to roads and other developments hinders the use of prescribed fire for restoring historic fire regimes.

Development and activities near or in the Merced River and its tributaries may adversely affect adjacent natural communities. Modifications of the river channel may cause channel instability and shifting, increased bank erosion and changes in flood flow elevations. Large quantities of sand and gravel from highly erodable areas could cause changes to downstream river-associated communities. The presence of well vegetated banks and a sufficient width of riverbank protects the integrity of the river channel and shore.

Disturbance in or near the Merced River and its tributaries may reduce the productive capabilities of associated natural communities. Modifications to river form, soil compaction, loss of riparian vegetation, removal of woody debris, and accelerated erosion and sediment transport influence important habitat characteristics such as riffle/pool complexes, substrate type, location, and cover. These physical aspects often determine the composition of vegetative and aquatic communities.

Roads change water inflow and outflow patterns and may dewater sections of meadow. The lack of a sufficiently high water table in meadows allows exotic species to outcompete native vegetation and

encourages conifer establishment, which threatens meadow communities.

Roads generally form barriers for wildlife and fragment habitat.

Development and impacts in riparian zones may influence critical water quality elements such as water temperature, suspended sediments, and nutrients. These elements interact in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms (USFS 1995).

Channelization and development in the Merced River channel and floodplain would impact riverine and upland interactions, hindering natural processes such as nutrient and resource exchange and the development of a shifting mosaic of habitats.

Ecological restoration of native communities would involve a four-step process. First, historic topographical and vegetative features (present before current alterations) would be researched. Detailed topographic maps from the 1920s are available, as are photographs and descriptions from earlier eras. Second, topographic contours would be recreated in the area, mirroring historic maps. Native vegetation would be protected or salvaged. Third, new vegetation would be encouraged by seeding and planting (from the same genetic stock). Fourth, visitor use would be redirected until vegetation had established.

CULTURAL ENVIRONMENT

The focus of this analysis is on assessing the effects of facility removal, redesign, construction, and environmental restoration on cultural resources in Yosemite Valley

Indicators

- number of archeological sites directly, indirectly, or potentially affected
- number of American Indian traditional cultural properties and resources directly, indirectly, or potentially affected
- number of historic sites, structures, and buildings directly, indirectly, or potentially affected
- number of cultural landscapes directly, indirectly, or potentially affected
- quality of preservation of and access to museum collections, archives, and research library materials

There are 107 documented archeological sites, two documented traditional cultural properties (one containing several features such as gathering areas), historic structures and buildings, five documented cultural landscapes (each with many features), and extensive museum, archive, and research library collections. In many places archeological sites, traditional cultural resources, historic structures, and cultural landscape elements overlap, forming a complex picture of human history in Yosemite Valley. To the extent possible, these are discussed as discrete resources. However, as resources overlap, so do the effects of proposed actions.

Of the 107 documented archeological sites, 90 have been either listed or determined eligible for listing on the National Register of Historic Places as contributing elements in the Yosemite Valley archeological district; 17 have yet to be evaluated for significance. Information regarding the type and significance of archeological sites is based on summary reporting (NPS, Hull and Kelly, 1995b). Discussion of impacts focuses on the number of sites affected. The discussion of cumulative impacts on archeological resources includes the district as a whole; in addition, significant effects to some resources could affect the cumulative value of the district.

Archeological investigations in Yosemite Valley have focused on prehistoric American Indian sites; the nomination for the Yosemite Valley archeological district addresses only these types of sites. However, 31 archeological sites with historic remains have been identified, and several other areas probably contain such remains.

Many locations in the project area contain no archeological remains but have cultural significance because of their use in American Indian practices and beliefs. Most, if not all, prehistoric sites are affiliated with contemporary Indian tribes or groups. These traditional cultural properties are considered eligible for the national register if they are rooted in the living community's history and are important in retaining the cultural identity of the community. Traditional cultural properties can include specific plant gathering areas, landforms, springs, prayer offering areas, archeological sites, and burials.

Many resources are extremely important for continuing traditional cultural practices but may be obtained in many locations. These traditional resources, because they are not place-specific or because the encompass large areas, are not generally eligible for the national register. Many are governed by NPS policies that require all cultural landscapes to be treated as cultural resources, regardless of the type or level of significance.

There are over 300 recorded culturally significant structures in Yosemite National Park; 50% of them are in Yosemite Valley. Of these, 78 are listed on the National Register of Historic Places, 3 are national historic landmarks, and 81 are listed on the park's List of Classified Structures. Only one national historic landmark, the rangers' club, has been documented with a historic structures report. Two national register historic districts are in the valley. Compliance has been completed on some structures that were slated for removal in the *General Management Plan.*

Inventories have been completed for five cultural landscapes in Yosemite Valley: valley general, Yosemite Village, Ahwahnee, Curry Village, and Yosemite Lodge. Their integrity and significance have been assessed.

Assessment of impacts on cultural resources generally follows a four-step process: (1) identifying the area of potential effect of the proposed action, (2) comparing that location with that of significant resources (listed on, or eligible for listing on, the National Register of Historic Places), (3) identifying the extent and type of impact of the proposed action on significant resources, and (4) assessing these effects according to procedures established in the regulations. Analyses of impacts on cultural resources under the alternatives are based on the types of actions proposed (environmental restoration, facility removal, facility redesign or adaptive use, and facility construction) and the typical effects these actions have on cultural resources. Some impacts are direct while others are indirect.

Several cultural resource studies have been conducted that form the basis for the analysis of impacts. In general, there is adequate data about prehistoric archeological resources, American Indian traditional cultural properties, and cultural landscape features. There are data gaps regarding historic-era archeological sites and the importance of many structures and other types of traditional cultural properties. These data gaps, as well as specific impacts that cannot yet be addressed because of the conceptual level of the alternatives, will be addressed in additional inventories, analyses, and mitigation.

SOCIOECONOMIC ENVIRONMENT

Two types of impacts have been assessed: parkwide visitor experience impacts and socioeconomic impacts. The parkwide visitor experience analysis primarily identifies and examines the projected changes to the visitor experience under each alternative. These impacts include effects on visitors from changes in recreational opportunities, park facilities, and operations.

The socioeconomic analysis projects changes in visitation and spending in response to the proposed VIP alternatives. The projected visitor responses (and the socioeconomic impacts on visitors) partly depend on the visitor experience. The visitor responses follow from past visitor behavior and trends.

The socioeconomic impact analysis identifies and evaluates the effects of the proposed VIP alternatives on park visitors and the affected

region. The analysis examines both long-term and short-term impacts (e.g., the temporary impacts of construction and implementation of the VIP alternatives). The expected changes in visitation and visitor behavior are identified and evaluated when possible.

Scope of the Analysis

The scope of the socioeconomic impact analysis is limited to those impacts solely associated with the VIP alternatives. This requires that all VIP-related impacts be clearly differentiated from impacts on Yosemite visitors and the surrounding region resulting from independent factors.

Yosemite visitors and the local economy could be affected by numerous operational and physical changes not related to the *Draft Valley Implementation Plan*. For example, park management actions (such as increases in park entry fees and implementation of a day use reservation system) could significantly influence current and future visitation to the park and/or visitor spending in the region. Similarly, physical changes to the park from both planned and unplanned events, such as proposed design changes to Yosemite Lodge and the January 1997 flood, could also affect park visitation and have socioeconomic impacts on the visitor population and the regional economy. These factors are all independent of this plan and will not be considered as impacts of the *Valley Implementation Plan.*

Factors Related to Park Visitation and the Regional Economy

This plan is one of many factors that could influence future visitation to Yosemite and the associated economic effects on the regional economy. While some factors could have a significant and important influence on future park visitation, other factors may have a minimal or negligible impact. Careful assessment of each factor could identify and evaluate the relative strength and influence of the primary factors that determine park visitation. It may then be possible to project the overall future visitation behavior in response to the *Valley Implementation Plan* with accuracy.

Past visitation and visitor patterns are important factors for determining future visitation and spending at Yosemite. Past visitation would be expected to be the predominant indicator of future visitation under the changes proposed in this plan.

Implementation Impacts

This section evaluates the impacts associated with implementation of the *Valley Implementation Plan* on the combined socioeconomies of the five-county Yosemite region. The discussion focuses on two potential sources of impacts: (1) those stemming directly from NPS and concessioner spending on VIP-associated planning, design, and construction, and (2) those resulting indirectly from the effects on visitation and visitor experience of construction-related noise, access restrictions, and other disruptions to the park environment.

The National Park Service anticipates that the *Valley Implementation Plan*, regardless of which alternative is selected, would be initiated in mid-1998. Under alternative 1, implementation is expected to be completed gradually within 10 years. Under alternatives 2 and 3, the construction components of the plan would be started in the first year and would be completed within five years. Therefore, the socioeconomic impact analysis assumes that all VIP-associated infrastructure, demolition, and restoration projects under alternatives 2 and 3 would be finished by mid-2003. Due to a lack of specific detail on project phasing, it is also assumed that any construction-related spending by the National Park Service and concessioner would be evenly distributed over the course of the construction period.

Construction Spending Impacts

Considerable labor would be needed to undertake the construction and related work planned under the VIP alternatives. This is particularly true of alternatives 2 and 3, which propose significant infrastructure changes. While construction-related work would continue year-round, an analysis of the nature and scope of the VIP alternatives indicates that onsite employment opportunities would be seasonal, with a majority of construction expected during the late spring, summer, and early fall.

The origin of the companies contracted to undertake the construction work will not be known until they are selected for the project. Therefore, several assumptions were made for the impact analysis. First, it is assumed that all the construction and onsite administrative services and materials required would be provided by companies operating within the five-county Yosemite region. Second, it is assumed that all VIP design and planning services would be provided by companies outside the region. These assumptions are based on several factors, including the uncomplicated nature and scope of the different infrastructural components of the VIP alternatives (which should require few specialized construction services), the park's historic pattern of outsourcing design and planning work, the geographic (and therefore cost) advantages afforded by construction companies operating near Yosemite, and the capacity of the affected region's construction and related sectors to provide the required services.

Socioeconomic Impacts on the Visitor Population

The socioeconomic impacts on the Yosemite visitor population would depend on a number of factors. The proposed changes to the park's facilities and operations would be a primary influence, since these would define visitor experiences in the park. Determining the likely visitor response to these and other factors is important for assessing the subsequent socioeconomic impact to the visitor population. It is important to distinguish those impacts associated with the VIP alternatives from those that are not.

Visitors might respond to changes in park facilities and operations by altering their demand for park access, their spending behavior, their use patterns, and their length of stay. Changes in visitor spending patterns represent an important potential impact on the region's economy. Yosemite visitor spending patterns could be affected by factors such as increased spending opportunities, changes in the visitor experience, and shifts in the visitor population if current visitors are displaced by others with different spending habits.

No reductions in the number of visitors are expected because any negative responses to changes in park facilities and operations are expected to be offset by people who didn't visit the park because of congestion and overcrowding in recent years.

Day excursion visitors are expected to be most discouraged from visiting Yosemite due to constraints on private vehicle access.

Constraints on peak season day use access coupled with improvements to the park's facilities and natural resources could increase visitation during the shoulder seasons, off-peak, and midweek. As visitation grows during the spring and fall and during midweek periods, total Yosemite visitation will continue to increase. This visitation growth would provide net economic gains to the region's businesses that serve travelers and positive direct and secondary economic impacts.

VIP-Specific Visitation Impacts

Many factors independent of this plan could influence future visitation to the park. As a result, it is not possible to quantify the specific impacts of the VIP alternatives on park visitation. However, differences in the proposed VIP alternatives can be expected to contribute to future visitation.

IMPACTS ON THE NATURAL ENVIRONMENT

Vegetation

Aquatic, Riparian, and Meadow Communities. At least 32 acres of aquatic, riparian, and meadow areas would remain diminished, fragmented, and degraded as a result of current development and impacts on natural riverine processes (such as redirected water flow and loss of vegetation due to human trampling). This figure includes impacts in aquatic, riparian, and meadow areas and does not include acreage that existed historically. Ongoing impacts would continue to slowly erode soil and associated vegetation and increase loss of habitat. The lack of a widespread consistent approach to the protection of aquatic, riparian, and meadow communities would hinder efforts to prevent degradation over the long term.

Selected infrastructure that was damaged by the flood of 1997 would not be repaired or rebuilt, but it would not be removed. This would inhibit restoration of historic meadow, riparian and aquatic communities in the flood damaged areas. These flood impacted areas include an additional 153 acres in Camp Six, Upper and Lower River Campgrounds, the concession stables, and the east end of Upper Pines Campground.

Approximately four acres would be restored. Because this alternative is based on a piecemeal approach that would be undertaken over many years, it cannot be reliably determined how many acres would be impacted.

Piecemeal attempts to reduce parking have proven unsuccessful. As long as the National Park Service attempts to control visitor numbers by limiting parking, visitors are likely to continue parking in undesignated areas. This would create additional disturbed areas.

Curry orchard, formerly a meadow contiguous with Stoneman Meadow, would continue to be used as a parking lot. Lamon orchard, historically a meadow, would not be returned to natural conditions, but removal of the concession stable would result in the recovery of approximately 7 acres of conifer/riparian habitat.

Roads would continue to bisect Sentinel Meadow, Stoneman Meadow, and Cook's Meadow. Roads also would continue to surround or partially surround Ahwahnee Meadow and Royal Arch Meadow. Indiscriminate roadside parking would continue, gradually widening the roads.

Three bridges (Sugarpine, Ahwahnee, and Stoneman) would continue to cause downstream vegetation and soil loss as a result of inadequate water capacity in the bridge design. Water flows around these bridges during periods of high water, scouring soil and vegetation. The cutoff channel (secondary to the main river flow) downstream from Sugarpine Bridge is increasing in size and capability to carry water due to constriction at Sugarpine Bridge. This cutoff channel could enlarge to carry the majority of the main channel flow, which would change the path of the main river channel and cause major losses in soils and vegetation at the cutoff channel outflow site. This would continue to be a significant risk to resources, visitor services, and safety.

Many tributaries of the Merced River are channelized or placed in culverts to accommodate roads and development. Tributaries historically flowed in a braided fashion toward the Merced River through talus at the base of the cliffs and then spread out in sheets at the meadow edge. Yosemite Creek, Indian Creek, Royal Arch flow, and Staircase Falls would continue to be channelized throughout the Yosemite Lodge complex, Yosemite Village, NPS housing, and Curry Village areas, preventing braided or sheet flows throughout Camp Six, Ahwahnee Meadow, Cook's Meadow, and Stoneman Meadow. The drainage below the fen near Happy Isles would

continue to be channelized to accommodate the east end of Upper Pines Campground.

The riparian corridor along the Merced River would remain compromised by heavily trampled banks, loss of the shrub and herbaceous understory, and increased erosion from Sentinel Bridge through Happy Isles Bridge.

Accelerated erosion would continue to degrade the physical integrity of riparian and aquatic systems along the shoreline, bank, and bottom of the Merced River. Natural species composition, productivity and structural diversity would continue to be impacted. Vegetation loss would continue to reduce shading of the river corridor, additions of organic matter, and the maintenance of microhabitats necessary for native plant, invertebrates, and riparian species. Riparian habitat features associated with bridges would continue to be degraded.

The water table would continue to be abnormally low, setting the stage for exotic species proliferation, conifer encroachment, and native species displacement, primarily in meadows.

Riparian and aquatic communities in the Taft Toe area are currently impacted by the El Capitan Bridge, which has an inadequate water capacity. The riparian zone adjacent to Taft Toe includes Devil's Elbow, a formerly popular picnicking and recreational spot. Visitor use has been directed away from fragile riverbanks in this area, but use continues in the Devil's Elbow restoration zone. The habitat in the Taft Toe area is bisected by two roads.

Taft Toe would not be impacted further in this alternative. Natural processes supporting riparian and aquatic communities adjacent to Taft Toe would continue to function in a relatively natural manner and would support wildlife. The riparian corridor between Devil's Elbow and El Capitan Bridge would continue to be impacted by pedestrians in areas not in the Devil's Elbow restoration zone.

Pohono Quarry has been impacted by use as a quarry, dumping ground, staging area for road maintenance, and various other uses. The Merced River is directly downhill from Pohono Quarry. Highway 140 runs through the riparian corridor between the Merced River and Pohono Quarry. There is indiscriminate roadside parking and associated foot traffic along the river corridor.

Pohono Quarry would not be impacted further in this alternative. Riparian and aquatic zones would continue to exist with a road in the riparian corridor. Associated roadside parking would continue to expand into riparian communities and foot traffic would continue.

Cumulative Effects — Historic photos and maps of Yosemite Valley show a significant decrease in the acreage of aquatic, riparian, and meadow communities. The consequences of disturbing these areas include reductions in abundance, biomass, species diversity, reproductive success, and survival of wildlife. Development and human activities have a significant influence on ecosystem processes and links between communities.

Conclusion — At least 32 acres of aquatic, riparian, and meadow communities would remain disturbed by development. An additional 153 acres would remain compromised as a result of flood damaged infrastructure in the area that precludes the restoration of natural communities. Four acres would be restored. Given that there are 506 acres of aquatic, riparian, and meadow communities on the valley floor, this would be a moderately detrimental impact on natural resources.

Upland Communities. There are 277 acres of development in Yosemite Valley that would remain in mixed conifer forests. These forests are degraded by pedestrian and vehicle traffic, structures, and roads. There is a coniferous overstory but almost no native herbaceous understory. The spread of exotic plants would continue to be exacerbated by trampling and soil compaction.

The ability of the park to manage the forest in and adjacent to developed areas is hampered by

visitor needs and infrastructure safety. Hazard trees must be removed from developed areas.

The mixed conifer community at Pohono Quarry would remain impacted by past uses.

California black oak woodlands would remain in the developed sites in the NPS housing area, residence 1, Yosemite Lodge, and the Ahwahnee Hotel. Irrigation of landscaping in these zones would continue to encourage fungal disease. The black oak woodlands would continue to be bisected and bordered by roads and development that influence natural hydrologic regimes. Noise and light pollution in natural habitats would continue.

The ability of the National Park Service to enhance California black oak woodlands would remain the same. There could be efforts to reestablish oak woodlands on a site-by-site basis.

There have been relatively few impacts on the live oak community near Curry Village, where there is lodging in a portion of the live oak community.

Cumulative Effects — Coniferous communities have significantly increased in the past 150 years, primarily due to changes in the fire regime and hydrologic patterns. The majority of current coniferous forest became established after 1870. California black oak communities declined dramatically during this same time period. Live oak communities remained relatively the same. Vegetation patterns would continue unchanged in this alternative.

Conclusion — Of 3,144 acres of upland communities in Yosemite Valley, at least 28 acres would remain disturbed, 28 acres would be restored, and 9 acres would be redesigned. Development has not had a significant influence on ecosystem processes in these areas. Fires have been controlled to protect development.

Rare, Threatened, Endangered, and Sensitive Plants. There would be no effect on sensitive plant populations.

Wildlife

Current impacts on wildlife and their habitats would continue. Developed areas would continue to provide sources of human food, continuing human/wildlife conflicts that threaten the safety of humans and the ecology of wildlife. Reaches of riparian habitat would continue to be degraded, affecting their quality for dependent wildlife and impacting nutrient cycles in adjacent aquatic habitats. Meadows would continue to shrink and be fragmented, which affects their suitability for great gray owls. Development in forest habitats would continue to impact special status species such as Cooper's hawk, sharp-shinned hawk, and California spotted owl. Degradation of any of Yosemite Valley's habitats could impact the nine listed (federal species of concern) bat species that use a variety of habitats.

Habitats at the west end of Yosemite Valley would remain relatively intact and would continue to have relatively low levels of visitor use compared with the east end of the valley.

The apple orchards in east Yosemite Valley would continue to attract wildlife, especially bears, which would result in continued property damage, threats to human safety, and alteration of wildlife ecology. This effect is most pronounced in Curry Village, where the orchard serves as a large parking lot.

Cumulative Effects — Piecemeal development and increasing human use over the history of the park have impacted wildlife through alteration of habitat and animal behavior. Prior development planning, for the most part, failed to consider sensitive or scarce habitats and wildlife species. A history of open dumps, bear feeding stations, open garbage receptacles, and uncontrolled feeding of wildlife by visitors set the stage for current human/wildlife conflicts.

Conclusion — Development will continue to diminish the amount of riparian, meadow, and mixed conifer habitat in east Yosemite Valley and affect the quality of adjacent habitats and associated wildlife species. Habitats and wildlife

TABLE 30: RIVER VALUES

Outstandingly Remarkable Values	Impacts
Scenic	Views of waterfalls, rock cliffs, black oak woodlands, and historic scenes would be enhanced by the removal of some development in the 100-year floodplain, including campsites.
Geological	No impact would occur.
Air Quality	Hydrocarbons, carbon monoxide, and oxides of nitrogen would remain at current levels.
Recreational	Hiking, picnicking, camping, fishing, photography swimming, nature study, horseback riding, biking, and sightseeing would all be enhanced by removing structures in the river corridor.
Biological	Biotic communities, particularly riparian areas and their habitats, would be enhanced by removing some of the development in the river corridor. Neotropical migrant songbirds and some rare bat species would benefit.
Cultural	None
Hydrological	The natural flood regime and hydrologic processes of the Merced River would be enhanced by removing some structures and campgrounds in the river corridor.

in west Yosemite Valley would remain relatively intact but would continue to be impacted by traffic and other uses along the two major roads running the length of the valley.

Merced River Scenic and Recreational Values

The most significant influences on Merced River values are development and the resource impacts that stem from high levels of unmitigated visitor use. Wading, walking, swimming, and inner-tubing along sensitive sections of riverbank are activities that give the sections of the Merced River (especially those along campgrounds) a damaged appearance, with riverbanks devoid of vegetation. The stone arch bridges across the Merced River are major developments in the river corridor but are generally recognized as having been successfully designed to appear appropriate to their place. Their appearance mitigates their effects on the character of the river, but they tend to hold the river in place and limit its ability to meander and change over time.

Sugarpine, Ahwahnee, and Stoneman Bridges are inadequately designed for the hydrology of the river and cause unnatural and adverse effects on its character and processes. The proximity of campsites to the river has had a major adverse effect on river character. Vegetation is generally affected, channel margins are eroded, and aquatic systems lack shading and organic material. These are important for restoring and preserving aquatic system diversity and stability. The ongoing riverbank restoration and removal of some development from the floodplain would improve the scenic, biological, and hydrological values along the river.

Cumulative Effects — Impacts from campgrounds, bridges, and development along the Merced River throughout the valley would continue with a total of 250 acres of development.

Conclusion — Development and visitor use have caused major impacts on the character of some sections of the Merced River in Yosemite Valley.

Water Resources

Hydrology. Current impacts on Merced River hydrology would continue. Impacts on river characteristics such as slope sinuosity and width:depth ratio stemming from inadequately designed bridges and development in the river corridor would continue.

Floodplains have been negatively affected by development. Buildings at Camp Six and Yosemite Lodge and campsites in Upper and Lower Rivers and Lower Pines Campgrounds are in places where the river and its tributaries had historically formed braided river channels. The fill material and protective measures used to make the sites more suitable for development have also negatively affected the river by limiting its geomorphic diversity and its ability to dissipate energy during peak discharge periods. Impacts on the floodplain would continue at the present level.

Water Quality. Impacts on groundwater quality in all of the alternatives would be minimal. Impacts on surface water, which is not used as a potable source of water, include numerous potential sources of contamination:

- the concession and NPS stables; expected impacts include increased nutrients, biological oxygen demand, coliforms, solids, and turbidity
- recreational activities; primary impacts are erosion and water-contact related
- stormwater runoff; primary impacts could include the release of contaminants into the Merced River (solids, nutrients, coliforms, other microbes, and organics).

Cumulative Effects — Hydrology and fluvial processes, which are crucial in sustaining the ecosystem dynamics in Yosemite Valley, have been greatly altered by development and human activities. These changes have negatively influenced the condition and distribution of high value aquatic, riparian, and meadow communities and the wildlife and fisheries that inhabit them.

Conclusion — Development and human activity in and along the river and floodplain have greatly impacted water resources and plant communities and dependent animal life. The greatest effects from development are caused by three inadequately designed bridges and by campsites placed too close to the river. The greatest effects on water quality are caused by human activity along the river and in the floodplain.

Air Quality

Effects on air quality would be primarily from automobiles and tour buses. Campfires have a negative effect on air quality during stable air conditions (often at night) and periods of greatest use.

No transportation strategy would be pursued. The majority of visitors to the park (70% of private vehicles and 100% of bus visitors) go to Yosemite Valley. Highways 120, 140, and 41 from outside the park and connecting park roads converge at the west end of the valley where motorists transfer to a one-way road system that loops the valley floor. Most visitors go to the east end of the valley, where facilities and services are located. Once at the east end of the valley, visitors can park their vehicles or drive from place to place throughout the valley. Circulator buses are available.

The number of day use vehicles coming into Yosemite Valley during peak season is approximately 3,086 per day (or 77% of the automobile entries). There are also approximately 918 vehicles per peak season day brought into the valley by visitors staying at lodging and campgrounds. About 16,300 tour buses enter the park each year (1995 data).

Emissions from automobiles and buses include volatile organic compounds (VOC), carbon monoxide (CO), nitrogen oxide (NO_x), particulate matter (PM), and sulfur dioxide

(SO_2). The estimates of emissions in 1995 from vehicles moving about Yosemite Valley and traveling between the park and gateway communities are listed in table 31. Emissions forecasts for 2015 are also included and are attributed to more stringent emission standards and California clean fuel regulations.

TABLE 31: EMISSIONS SUMMARY, VEHICLES IN YOSEMITE VALLEY AND BETWEEN THE PARK AND GATEWAY COMMUNITIES

	Tons per Year	
Pollutant	1995	2015
VOC	200.0	90.0
CO	1,681.0	261.0
NO_x	198.0	73.0
PM	3.8	2.5
SO_2	8.3	6.9

Source: EA Engineering 1996

Cumulative Effects — The greatest influences on air quality in the Yosemite region are emissions from sources outside of the park and beyond the adjoining counties. Emissions from vehicles getting to and moving around Yosemite Valley are only a small portion of the pollutants in the region. Some of the most negative influences on visitor experience are seen in places where parking is provided for major attractions. Campfires have significant direct and localized effects on air quality during some hours.

Conclusion — Under the no-action alternative, most visitors would continue to use their automobiles to travel to and around Yosemite. This would result in direct local and regional impacts on air quality. Air quality impacts affect the experience of the visitor, especially in parking areas and campgrounds.

Scenic Resources

There would be no changes to scenic resources and quality. The NPS and concession maintenance areas have major direct and negative effects on the quality of the view from Glacier Point because they are large and lack screening. Most buildings in the valley are screened to a major extent by vegetation.

The effects of intrusions at other viewpoints are more moderate. Development is generally less visible or the number of visitors using the viewpoint is considerably lower.

No development in the valley is visible from Tunnel View, another of the most popular view points of Yosemite Valley.

Cumulative Effects — Development is a major intrusion into some viewsheds, but Yosemite Valley remains one of the premier scenic attractions in the world.

Conclusion — Development has had effects on the scenic quality in Yosemite Valley. The NPS and concession maintenance and warehouse complex has a direct, negative effect on the view from Glacier Point. Effects at other viewpoints are more moderate.

Noise

Periods of natural quiet and sound from waterfalls, rivers, and wind are common only in off-peak visitation periods.

Automobiles and buses have a major negative effect on their surroundings. There is nearly constant background noise in many locations. There are more than 6,000 vehicle passes per day at some places along Northside and Southside Drives during peak periods. These include employees, delivery vehicles, and visitors, some of whom apparently drive around the valley several times in a day. The noisiest hours along Southside Drive are during peak hours (around noon) when traffic can exceed 611 vehicles per hour. The noisiest hours along Northside Drive are during late afternoon and early evening when as many as 720 cars per hour exit the park. Some of these are employees.

Noise levels at Four-Mile Trailhead, Chapel straight (on Southside Drive), and El Capitan

straight (on Northside Drive) range from 63.2 to 85.2 dBA, with averages around 70 dBA. About 50 to 100 meters away from the road, traffic noise levels are similar to background levels — around 64 dBA. The sounds of individual vehicles can be easily distinguished from background sounds.

The sounds of diesel shuttle buses and motor coaches are easily distinguished from other background sounds, even over distances in which their noise levels are not greater than ambient sounds. Two electric shuttle buses have been added to the shuttle fleet. Their noise levels for brakes and some mechanical functions are similar to those for the diesel transit buses currently in use (brief 80 dBA peak), but their typical operating noise levels (67 to 72 dBA) are somewhat less than those for diesel buses (71 to 77 dBA). Their operating noises are not as easily distinguished from those of other background sounds, so effects are less than with diesel buses. These buses have less passenger capacity (35 to 40) than the standard diesel shuttle bus (75).

Cumulative Effects — The number of vehicles in Yosemite Valley requires an extensive road and parking network. This network extends the influence of vehicle noise to nearly all areas of the valley, to nearly every attraction and vista and along every major meadow, which negatively affects the visitor experience.

Conclusion — Automobiles and buses have a serious direct and negative effect on the character of Yosemite Valley through the near constant production of noise in the most heavily used and popular visitor areas.

IMPACTS ON CULTURAL RESOURCES

The National Park Service is mandated to preserve and protect its cultural resources through the organic act of August 25, 1916, and through specific legislation, policies and guidelines such as the Antiquities Act of 1906, the National Environmental Policy Act of 1969 (as amended), and the National Historic Preservation Act (as amended), NPS *Management Policies*, the *Cultural Resources Management Guideline* (NPS 28), and the Advisory Council on Historic Preservation's implementing regulations regarding "Protection of Historic Properties" (36 CFR 800). Other relevant policy directives and legislation are detailed in NPS-28.

Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies having direct or indirect jurisdiction over undertakings consider the effect of those undertakings on properties listed on or eligible for listing on the national register and afford the Advisory Council on Historic Preservation an opportunity to comment. Section 106 compliance for actions affecting historic properties prescribed in the *General Management Plan* and *Concession Services Plan* were the subject of a 1979 memorandum of agreement among the NPS, California state historic preservation office (SHPO) and Advisory Council on Historic Preservation along with a case report and accompanying correspondence. The National Park Service is consulting with the state historic preservation office and the council to develop a programmatic agreement to take into account the effects of actions in this plan as well as park operations and maintenance on historic properties. This programmatic agreement will establish a process for the treatment of historic properties that includes consultation, identification, evaluation, and, if necessary, consultation.

Archeological Sites

Archeological sites would continue to be impacted by the existing placement of development and levels of human activity. Efforts to preserve the condition of sites and their information potential would continue as at present, with possible adverse effects from loss of archeological material through piecemeal implementation of the *General Management Plan, Concession Services Plan,* and *Draft Yosemite Valley Housing Plan.*

Implementation actions would continue to require project-specific archeological

compliance, thus avoiding most adverse effects. However, this work would be piecemeal, project-by-project in approach, with little programmatic and routine site monitoring, controlled surface collection, or data recovery excavation in developed areas. The latter activities are a goal of a memorandum of agreement between the National Park Service and the California state historic preservation officer.

Archeological sites would continue to be treated under the terms of this agreement with the California state historic preservation officer. The *Cultural Resource Management Plan* identifies several levels of treatment for archeological properties, addressing direct and indirect effects of the *General Management Plan.* The actions in the *Cultural Resource Management Plan* are guided by a parkwide archeological research design for historic and prehistoric archeological properties and consultation with the California state historic preservation officer and the American Indian Council of Mariposa County, Inc. Some elements of this plan have been implemented, mitigating the effects of implementing the *General Management Plan.* One of these commitments, a parkwide archeological research design for prehistoric resources, was prepared in 1981 and revised in draft in 1996. These designs, which are used to systematically conduct site evaluations and data recovery excavations for projects, serve to mitigate the effects of projects on archeological materials.

Effects on archeological sites have been assessed in the other planning documents. However, new information has been generated through project-related inventories that identified many previously unrecorded prehistoric and historic sites; more detailed excavation data that contributed to an understanding of the nature and significance of sites; and construction monitoring data that has highlighted the potential for buried sites. Direct adverse effects to two sites in Yosemite Valley were identified in the *General Management Plan* and are to be mitigated by data recovery excavations. In addition, 88 sites would continue to be affected to an unknown level by developments such as campgrounds, picnic areas, and housing areas. These effects are to be mitigated by site mapping, monitoring, and protection or data recovery excavation.

Actions identified in the *Draft Yosemite Valley Housing Plan* and *Concession Services Plan* involve direct effects to one newly documented site near Yosemite Lodge. These effects are described as not adverse; archeological data recovery would mitigate the impacts.

Reducing the number of park visitors could reduce visitor activity impacts on archeological sites. Visitor activity was noted as the most frequent site impact, affecting 48% of all sites documented in Yosemite Valley (NPS, Hull and Kelly, 1995).

Cumulative Effects — The consequences of disturbing these sites could result in moderate to significant loss of archeological information, which could be partly mitigated through careful planning and data recovery.

Conclusion — A total of 90 sites (85% of the documented sites in Yosemite Valley) would be either directly affected by actions of approved plans or continue to degrade under existing conditions. Long-term preservation would be enhanced at six sites. This alternative proposes the most numerous impacts on archeological sites.

American Indian Traditional Cultural Properties

The American Indian Council of Mariposa County, who represent the Southern Sierra Miwok, and other groups maintain a meaningful association with Yosemite Valley.

Elements of the *General Management Plan, Concession Services Plan*, and *Draft Yosemite Valley Housing Plan* would continue to be implemented on a piecemeal or project-by-project basis. This includes construction of a cultural center that would provide for traditional activities. Effects of these actions on traditional cultural resources were generally assessed in

these planning documents. However, effects on specific resources such as gathering areas are not completely understood. These efforts are likely to take place on a project-by-project basis. The National Park Service would consult with affiliated American Indian groups in an effort to avoid or mitigate effects.

Cumulative Effects — There have been adverse effects on traditional cultural properties throughout Yosemite Valley, yet many sites and resources of significance to American Indian communities have been retained. This alternative proposes removal of development in Yosemite Valley. American Indian interests would prefer that more development be removed to improve the traditional value of the area.

Conclusion — Consultation and collaboration with the various American Indian groups and individuals should ensure a meaningful association with them. Impacts on traditional cultural properties are not well understood.

Historic Sites, Structures, and Buildings

The *General Management Plan, Concession Services Plan*, and *Draft Yosemite Valley Housing Plan* call for both preserving and removing historic buildings in Yosemite Valley. Plans specify the disposition for NPS and concession administration and maintenance facilities, visitor lodging, and employee housing. Many of these properties were determined to be historically significant. The proposals to remove historic buildings resulted in adverse effect determinations, the completion of section 106 consultation with the California state historic preservation office, and agreements to complete certain preservation, mitigation, and documentation measures.

This alternative would result in the implementation of these plans on a piecemeal or project-by-project basis. Implementation of required compliance would also continue on a piecemeal basis. Historic preservation staff would continue to monitor and coordinate preservation-related projects.

All management, preservation, and maintenance actions for historic districts, national register-eligible and listed structures would continue as they are at present, using the *Secretary of Interior's Guidelines for Rehabilitation*. The condition of structures varies, and necessary maintenance and management actions are performed for the buildings used most by the public.

Yosemite Village Historic District

Structures that could be removed under this alternative include the superintendent's residence and garage, the Ahwahnee Row houses and Lower Tecoya concession housing, the concession headquarters and garage complex, and many structures in the NPS maintenance area. The park headquarters would be adaptively used, as called for in the *General Management Plan.* These effects would be no different than those called for in the *General Management Plan* and other planning documents. Documentation, if not yet concluded, would be completed before removal.

Ahwahnee Hotel

The structures at this national historic landmark would be retained and preserved as is.

Camp Curry Historic District

Piecemeal implementation of the *Concession Services Plan* could result in a reduction in the number of tent cabins and replacement of 80 cabins without baths. The reduction in tent cabins from 276 to 150 would restore more historic conditions (density of units), a positive effect. Replacement of 80 cabins without baths that retain considerable integrity with 149 rooms in singles, duplexes, and quads (as called for in the *Concession Services Plan*) would be an adverse effect. Huff House could be removed as called for in the *General Management Plan.* Effects that would be adverse are identified in the *General Management Plan, Concession*

Services Plan, and other planning documents. Documentation, if not yet concluded, would be completed before removal.

Curry Stables and Lamon Orchard

Lamon orchard would be preserved and maintained for interpretive purposes, as called for in the *General Management Plan.* This would be a positive effect in terms of preserving historic properties. Other issues (see "Wildlife" and "Water Quality") would remain unresolved. The Curry stable would be relocated to the former Curry dump site as prescribed in the *Concession Services Plan.* Conditions at the previously disturbed dump site would remain unchanged, but loss of this historic property would be an adverse effect.

Yosemite Valley Bridges

All Yosemite Valley bridges listed on the National Register of Historic Places would be retained under this alternative. This would be a positive effect in terms of preserving historic properties. Other issues (see "Hydrology" and "Vegetation") would remain unresolved.

Cumulative Effects — The implementation of *General Management Plan* as well the *Concession Services Plan* and the *Draft Yosemite Valley Housing Plan* would result in an irretrievable loss of historic property throughout the valley. This loss would not eliminate whole districts but would result in the loss of elements in districts. Many structures would be adaptively reused, altering their function but preserving historic fabric. Many structures would continue to be used as originally designed in districts that retain much of their character.

Conclusion — Implementation would result in irretrievable loss of historic property throughout Yosemite Valley. These adverse effects were called for in the *General Management Plan* and Concession Services Plan. Consultation/ compliance under section 106 of the National Historic Preservation Act has been completed.

Cultural Landscapes

Under this alternative, many landscape elements in Yosemite Valley would be removed as prescribed in the *General Management Plan* on a piecemeal, project-by-project basis. When the National Park Service consulted with the California state historic preservation officer on the provisions of the *General Management Plan*, discussions centered around effects on historic structures, not cultural landscapes. Many historic structures were identified as elements of the cultural landscapes in the valley (NPS, Land and Community Associates, 1994).

An important aspect of cultural landscape management is the recognition of change as an essential aspect of the landscape (NPS, Land and Community Associates, 1994). In the history of Yosemite, there have been many changes to the landscape as management practices, park design, management theory, and visitor needs have changed. Many character-defining landscape elements retain much of their integrity, while others have been altered substantially. The effects of implementing actions under this alternative would be variable.

Yosemite Village

A significant number of character-defining landscape features would be removed in Yosemite Village, but a great number of features would be retained and preserved.

Piecemeal removal of the concessions headquarters, garages, and Lower Tecoya housing (including the Ahwahnee Row houses), and NPS maintenance and warehouse facilities would take place. From a cultural landscape perspective, effects of removal would be adverse, since most of these structures contribute to the integrity of the cultural landscape. To mitigate these effects, documentation would be completed (in some cases this work has been completed).

The museum, NPS headquarters building, rangers' club, post office, and Rustic housing would be retained and would continue to be major character-defining features of the landscape. These are positive effects and would contribute toward preserving landscape character. The function of the area would change as administrative functions were moved out of the valley and visitor services were expanded. This would not be a significant effect.

The Yosemite Village Historic District includes NPS residences, apartments, garages, woodsheds, curvilinear roads and paths, plantings, the cemetery, and other features, most of which were constructed in the 1920s and 1930s. These will be preserved, a positive effect.

Ahwahnee Hotel

All character-defining elements of the landscape, including the hotel, guest cabins, approach (circulation), parking, and landscape would be retained and preserved in their current condition, a positive effect. The employee housing area has been altered extensively and does not contribute to the integrity of the area; it would be retained in this alternative, which could be a negative effect.

Curry Village

Most of the significant character-defining features of the landscape would be retained.

In the visitor tent cabin area, 276 units would be removed as prescribed in the *General Management Plan* and the *Concession Services Plan* to take lodging units out of the rockfall zone. The tent cabins are an important part of the history of Camp Curry, but the density of units has been increased and circulation altered since their period of significance (1899–1945). Employee tent cabins would also be eliminated in the area. The reduction in tent cabins could have a positive effect by restoring more appropriate density.

The wooden bungalows have considerable integrity and would be rehabilitated, a positive effect. The 80 cabins with bath, which have deteriorated over the years and required major replacement of materials, would be removed and replaced with 149 units. The major effect in the area of the hardsided cabins would be a possible change in arrangement. This would be mitigated by arranging the buildings using similar design guidelines but preserving the boundaries and distinctions of the existing bungalow configuration.

The visitor services/administrative core area, visitor arrival area, and circulation have been altered to the point that few elements date from the period of significance. Retaining them as is would be neither positive nor extremely negative. The Curry orchard, which is used as a parking area, was proposed as parking by the Olmsted Brothers firm in 1927. Its retention would be a positive effect in terms of preserving significant landscape elements, but wildlife issues (bear/human interactions) would remain unresolved.

Yosemite Valley

There would be few major effects on the character-defining elements of the valleywide landscape.

Most of the campgrounds in the valley have been altered substantially over the years, but remain in their historic locations. Upper River, Lower River, Upper Pines, Lower Pines, and North Pines campgrounds contribute to the valleywide integrity of location, association, and feeling, but because of substantial alterations they do not possess integrity of design, materials, workmanship, or setting. Retaining the campgrounds in their current locations would be positive from a cultural landscape perspective, but other issues (related to the hydrology and riparian systems) would remain unresolved.

Many of the buildings and other structures, including the nature center, the amphitheater in

the Lower Pines Campground, LeConte Memorial Lodge (national landmark), the rangers' club (national landmark), Yosemite Valley chapel, the concession stables, and the superintendent's residence (residence 1) retain considerable integrity. All but residence 1 and the concession stables would be retained, which would be a positive effect since it would preserve important landscape elements. Residence 1 has been inundated by floods on several occasions, most recently during the January 1997 flood.

The road system would be retained as is, with little change to foot trails and bridges and the bridle path. These circulation systems, which have been altered in many ways over the years, also retain considerable integrity. Keeping the circulation system as it is would have a positive effect.

Cumulative Effects — In most cases, the landscapes of Yosemite Valley (even after removal of landscape elements) would retain a design appropriate to place and a function that is intended to meet visitor needs. These cultural landscapes would continue to contribute to the overall significance of Yosemite.

Conclusion — This alternative would result in many adverse effects on cultural landscapes, but important character-defining features would remain. These effects were called for in the *General Management Plan.* Most of the changes would involve the elimination of buildings.

Museum, Archive, and Library Collections

Museum and library collections would continue to be housed in the crowded Yosemite museum building, as well as in El Portal, Wawona, and the valley. Archival and archeological collections would be moved to a new building in El Portal. Conservation and protection would be provided at current levels, which are below standards established by law and in violation of NPS policies and guidelines. The effect of this level of management is uncertain for the collections themselves. Issues of concern for all collections would continue to be adequacy of staffing and funding for collections planning, records and inventory management, storage and housing, conservation treatment and monitoring, exhibition, and emergency readiness. If these issues are dealt with adequately, then effects should be minimal.

The collections would continue to be housed primarily in inappropriate structures that are separate and, in some cases, at a distance from supervision. Appropriate response to emergencies would not be possible for collections in some locations. Facilities would lack adequate protection systems and would be vulnerable to fire, theft, and vandalism. Collections would continue to be vulnerable to insect infestation and animal damage. Only those collections retained in the museum building or in archival storage in El Portal would have minimal environmental controls for temperature and relative humidity. Other collections storage areas do not have appropriate environmental controls. These conditions present a risk of possible adverse effects on collections.

Housing for collections would still be crowded. Space for management would be insufficient, and access to the collections for adequate recordkeeping and inventory would be difficult. Accountability would be difficult. Collections inspection would continue to be made difficult by storage conditions, so objects would be vulnerable to undetected damage or destruction.

Visitor and researcher enjoyment and use of the collections would be limited to present use limits and conditions. Adequate study areas would not be provided. Access for disadvantaged users would continue to be possible only through complicated and strenuous procedures.

Cumulative Effects — Cumulative effects stem from the nature of storage facilities, which put elements of the collection at risk.

Conclusion — Yosemite has one of the largest, most complete collections in the national park

system. These collections are maintained but are vulnerable to deterioration.

IMPACTS ON VISITOR USE AND INTERPRETATION

The visitor experience and interpretive programs would continue as they are. The time visitors spend in the valley would be negatively affected by overcrowding and competition for space. Returning visitors are often well oriented to the valley, but new visitors can find it difficult to find their way. Day use visitors are directed to a parking area remote from all orientation and interpretive services. Even locating the closest shuttle bus stop can be difficult. Overnight guests find slightly more orientation at lodges and campgrounds. This lack of accessible orientation invokes an element of chance in visitors' encounters with the resources and programs. Lack of wayfinding assistance exacerbates crowding and competition for space and distracts visitors. Their focus can be on the need to find a space to picnic, camp, sleep, or eat — at the cost of appreciating the beauty of the place.

Day use parking would continue to be dispersed throughout the east end of the valley. As a result, significant traffic congestion would continue to impact the visitor experience. Since car traffic in the valley is largely uncontrolled, visitors might be encouraged to use their cars in the valley instead of using the shuttle system. This would further increase traffic congestion. This additional traffic could occur as long as excess parking spaces remain since visitors would be more inclined to use their own vehicles to move around the valley if parking is available. The additional parking capacity could provide some benefits in convenience for those visitors using their own vehicles and could enable day use visitors to extend their length of stay.

Information / Orientation Service

The limited availability of information/orientation services and their location in the most congested campgrounds and the village would remain a problem for visitors and staff alike. Visitors would continue to have to search for ways to find out where they are, where they want to go, what there is to do, and how to get there. The obscurity and scarcity of information services would continue to cause frustration and alienation for visitors and would significantly reduce the park experience.

Interpretation

Interpretive experiences would continue to be focused toward the east end of the valley. Facilities available would be limited to those now available except for the addition of an American Indian cultural center. The center would increase the already heavily emphasized Indian cultural interpretation program. Only a small percentage of visitors would be introduced to the significance of Yosemite's resources and their preservation through visitor centers, audiovisual programs, museum exhibits, and ranger-guided programs. The museum collection would continue to be inaccessible to visitors as museum space remains very limited.

Recreation

Passive recreational pursuits would remain mostly unchanged, except that as visitation patterns broaden there would be more days each year when crowded conditions would be expected. A substantial amount of traffic, traffic noise, and parked vehicles would continue to intrude on many recreational pursuits. Walking would take place on paths shared with bicycles and horses. Opportunities for photography would continue to be impacted by large numbers of vehicles and visitors.

Camping, picnicking, and dining would continue to be available. There would still be campsites in areas with flood and rockfall danger, and campgrounds would continue to be crowded. The limited number of picnic sites would continue to cause picnickers to use parking medians and roadsides.

Active recreational pursuits would remain mostly unchanged, affected by crowded conditions through much of the year. Traffic congestion and periods of searching for parking would consume time that would otherwise be used for active recreation. Bicycle touring would continue to be available, largely in competition with automobiles on the roads. Bicycle paths are sometimes shared with horses and pedestrians.

Horseback riding would continue along bridal paths. Competition with hikers for use of these routes would continue; conflicts would occur.

Cross-country skiing would still be available, although opportunities for a quality experience in solitude would be rare, since little of the valley is roadless. This would continue to be a minor negative effect, but the quality of the setting would dominate the experience.

Visitors with disabilities would rely on their personal vehicles to move about the valley and access valley destinations, even in those locations that are closed to vehicles and served by shuttle bus. This would mitigate possible negative effects but would segregate elements of the public. Picnic areas, campgrounds, viewpoints, and services could be accessed by personal vehicles.

Cumulative Effects — Yosemite Valley continues to be one of the most spectacular recreational settings in the world. However, the combination of visitation levels, traffic congestion, and overextended visitor services causes many visitors to avoid the valley during peak periods because of their cumulative effect on the visitor experience.

Conclusion — Recreation and interpretive activities would be significantly affected by visitation levels, traffic congestion, and overextended visitor services.

IMPACTS ON SOCIOECONOMIC CONDITIONS

All the physical changes to the park stipulated under alternative 1 either have already been proposed in earlier planning studies or are necessitated by the damage from recent flooding (such as replacement of campsites). Implementing this alternative would not require the Park Service and concessioner to finance any projects in addition to what has been previously authorized (and that will be implemented once funding becomes available). No VIP-related construction is proposed under alternative 1, so this alternative would have no construction-related impacts.

Alternative 1 includes changes in the park's infrastructure and facilities resulting from the January 1997 flood, such as the loss of many sites at River Campgrounds and the construction of hundreds of replacement campsites. The net reduction in campground capacity to the limit established in the *General Management Plan* (756) is not considered a VIP impact. The damage also resulted in closure of the park for several months during the winter of 1997. Therefore, at least in the short term, some reductions in park visitation are expected from potential visitors unaware that the park has reopened or are otherwise discouraged from visiting the park as a result of the flood.

Alternative 1 presents the conditions for the park if no VIP modifications of existing plans are implemented. Day use parking would initially be unchanged from the current 2,300 spaces.

While alternative 1 would provide, at least in the short term, a significantly greater number of parking spaces in the valley than the other VIP alternatives, the additional parking capacity would not allow any increase in total day use visitation over current levels.

Under alternative 1 there would be 756 NPS campsites operated in Yosemite Valley. This is the maximum number of campsites consistent with the provisions of the *General Management Plan.* To achieve this camping capacity, 380 new campsites would be constructed to replace those destroyed during the January 1997 flood. This number of campsites represents the baseline conditions for estimating socioeconomic impacts associated with the *Draft Valley Implementation Plan.*

This number of campsites is less than the number of sites that existed before the flood. The reduction in the number of campsites is attributable to the flood, which destroyed hundreds of campsites in and adjoining the Merced River floodplain. Any lost visitation and visitor spending impacts resulting from the reduced overnight camping capacity are solely flood related socioeconomic impacts. Similarly, proposed construction of the 380 replacement campsites is considered an impact of the 1997 flood. Therefore, the campsite construction costs and their socioeconomic impacts on the region are independent of the VIP impact analysis.

Cumulative Effects — Changes brought about by implementing the *General Management Plan* would continue to affect the primary concessioner. These changes have benefitted the gateway communities as has the increase in visitation throughout the park.

Conclusion — There would be no VIP-related effects beyond those of the *General Management Plan, Concession Services Plan,* and *Draft Yosemite Valley Housing Plan.*

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The removal of historic structures and character-defining elements of the landscape would result in an irretrievable loss of these resources. Any loss of archeological sites would also be irretrievable.

Section 106 compliance for actions prescribed in the *General Management Plan* and the *Concession Services Plan* has been completed. Documentation and data recovery efforts would provide mitigation. The level of documentation would be established through consultation with the California state historic preservation office as part of the 106 compliance described in the *General Management Plan* and the *Concession Services Plan.*

IMPACTS ON THE NATURAL ENVIRONMENT

Vegetation

Aquatic, Riparian, and Meadow Communities. The proposed action would provide significant protection for and enhancement of natural river processes and aquatic, riparian, and meadow communities with the establishment of the Merced River management zone and reconnection of fragmented habitats into larger biotic communities. The National Park Service would restore 21 acres of previously impacted aquatic, riparian, and meadow communities. It would redesign 6 acres and develop 6 acres. Removal of roads through Ahwahnee and Stoneman Meadows would restore critical surface and subsurface water flow regimes and water table levels. All of these actions would greatly enhance functioning of natural plant communities.

A 64-acre block of land, running from the major meander of the Merced River that currently encloses Upper and Lower Rivers Campgrounds to Ahwahnee Meadow and west to Camp Six, would be restored, which would provide a complex assemblage of meadow, riparian, braided channel, and mixed conifer components. Maps developed in the early 1900s show that the majority of this area was meadow traversed by numerous shallow cutoff channels fed by the Merced River and its tributaries. Many of these channels have since been filled in to accommodate development. The majority of restored acreage in this area is expected to return to riparian, meadow, and aquatic communities with the restoration of historic soil contours. As shown in historic maps and photos, this site supported a wetter, more diverse community than at present. River dynamics, including high water periods during even average discharge years, would play a key role in ecosystem maintenance by maintaining natural regimes of water, sediment, and nutrient dispersal. This would return the river corridor to its role in the physical foundation of a stable, diverse, and productive assemblage. With the removal of roads and campgrounds, this assemblage and its links to adjoining areas should provide a positive effect through improved habitat for riparian-dependent species. Removal of development adjacent to Indian Creek, a major surface flow tributary, would allow dechannelization to recreate natural flow.

The establishment of a Merced River management zone (after removal of development) and the connection of fragmented riparian zones would restore and maintain the physical integrity of the river channel. This would allow riparian vegetation to reestablish, which would decrease erosion potential and stabilize the soil. Natural species composition and productivity would be enhanced. This zone would expand the opportunity for the input of large woody debris into the river channel. Shading and additions of organic matter would increase as riparian species establish in formerly trampled zones. The protection of vegetation along the riparian corridor would improve the riparian corridor for wildlife. The herbaceous layer would be enhanced by the management of foot traffic through proposed large restoration areas. More snags, large diameter trees, and downed logs would remain onsite, creating more microenvironments for vegetation and enhancing wildlife habitat, a positive effect.

New development on 20 acres adjacent to the riparian zone would indirectly impact the zone. Addition of campsites in Upper Pines Campground and the proximity of the new Group Camp to the fen near Happy Isles could cause trampling in the aquatic, riparian and meadow communities though use would be minimized through proactive visitor management. New development in the area of the concession stables and Lamon orchard could preclude natural functioning of the historic meadow.

The physical foundation of aquatic, riparian, and meadow communities would be greatly

enhanced by the reconnection of fragmented habitats, bank stabilization, vegetation establishment, reestablishing natural soil scouring and depositional patterns, and decreased soil compaction in restored areas. Links between riparian, aquatic, and meadow communities would be greatly strengthened and would allow for a naturally shifting mosaic of habitats.

Prescribed burning would be easier in a larger area, which would help to re-create historic vegetation diversity and patterns and allow natural meadow edges to reestablish.

Roads would be removed from Stoneman Meadow, Ahwahnee Meadow, and the northeast side of Cook's Meadow (in the village area). This would restore natural water table levels critical for the sustenance of native meadow plant communities and would restore flood interactions between the main river channel and the meadows. Wet conditions would discourage conifer invasions. The road across Sentinel Meadow would remain and continue to inhibit natural water flow, negatively affecting the meadow.

Sugarpine Bridge, Stoneman Bridge, and Ahwahnee Bridge (with some associated riprap) would be removed, which would allow the riparian habitat to recover (see photo). Soil and vegetation loss connected with the bridge sites would stop. Removal of the bridges would reduce the proportion of flow entering cutoff channels and over-topping the bridges and would allow a stable bank configuration to develop faster (NPS, Jackson, Smillie, and Martin 1997). Removal would allow for the Merced River to function as a meandering alluvial river occupying floodplains during periods of high water. The cutoff channel associated with the Sugarpine Bridge would follow natural hydrologic patterns with major benefits to Merced River dynamics, revegetation potential, and habitat recovery.

The relocation of flood damaged campgrounds to less sensitive areas, redesign of North Pines Campground, and the relocation of Group Camp and the walk-in camp would allow native vegetation to reestablish in trampled areas. Effects of constructing new campsites would be directed toward mixed conifer areas (see Upland Communities).

Exotic species could increase in the short term after construction but could decrease under proper management. Exotic plants favor newly disturbed ground, though native species generally outcompete exotic species in the presence of a high water table in Yosemite Valley. Initial restoration methods would involve the disturbance of expanses of soil that would be seeded, mulched, and planted with native vegetation, which would minimize establishment of exotics. This could be mitigated further by decreased trampling and soil compaction and consistent monitoring and removal of exotic species during the revegetation.

Riparian and aquatic communities in the Taft Toe area would have heavier visitor use. This could cause trampled riverbanks, compacted soil, loss of shrub and herbaceous understory layers, and increased erosion. This could be partially mitigated by concentrating use into a more resilient site, such as Cathedral Beach, using substrates that are better able to accommodate trampling, and formalizing trails.

Impacts on Pohono Quarry would be the same as in alternative 1.

The discontinuation of concession-guided stock tours would reduce erosion and manure (and associated nutrients) on trails in several meadow and riparian communities.

Cumulative Effects — This alternative would represent the first beneficial cumulative effect on aquatic, riparian, and meadow communities since the mid-1800s. Meadows would be reconnected and riverbanks restored.

Conclusion — A total of 21 acres of aquatic, riparian, and meadow communities would be restored in Yosemite Valley. Given that there are only 506 acres of these communities on the valley floor and that these communities are among the most productive and fundamental to the eco-

logical system, this would be a major beneficial impact on community-level biodiversity.

Upland Communities. In upland communities, 64 acres would remain disturbed, 115 restored, 64 redesigned and 49 developed. Restoration of 92 acres of degraded mixed conifer is proposed in this alternative. The largest restored area would be in Upper and Lower River Campground and the Camp Six / Village Store area. Restoration would take place in what is currently classified as developed mixed conifer, but much of the restored acreage would revert to meadow and riparian communities based on projected water table levels and historic plant communities on those sites.

New development in mixed conifer communities would total 41 acres. This would include replacement of new campsites near the concessioner stables and the new Group Camp west of Happy Isles and the Taft Toe staging area. Redesign in the mixed conifer forest would total 48 acres at North Pines, Lower Pines, Curry Village, and at concession housing at Yosemite Lodge. Effects of constructing new facilities would be directed toward mixed conifer areas, which are generally more resistant to recreation-related impacts, given proper design that takes into account soil compaction and the driplines around the tree canopy.

The ability of the park to manage the forest with prescribed fire would be greatly enhanced in the zone created by the removal of development between Camp Six and Upper and Lower River Campgrounds. This would also increase the size of the buffer zone between wildlife and development. In new development areas prescribed fire would not be used, which would affect forest structure and allow fuels to accumulate.

The mixed conifer community would be severely disrupted in newly developed areas. Overstory species would partially remain, but the shrub and herbaceous understory could be eliminated, except for fenced landscaping. Soil would be compacted, encouraging runoff and invasive exotic plant species.

Reducing circulation and parking in the east end of the valley could result in higher visitation in the west end. All restoration and development of the east end of the valley would take place in previously impacted areas. The Taft Toe site would add impacts on previously disturbed mixed conifer communities that are in a largely natural area, fragmented by roads.

Impacts on Pohono Quarry would be the same as in alternative 1.

Restoration of three acres of California black oak woodland would result from the removal of the tennis courts at the Ahwahnee Hotel and the removal of the road in Ahwahnee and Stoneman Meadows.

The quality and quantity of California black oak woodlands would remain the same as in alternative 1. Efforts to reestablish oak woodlands would be decided on a site-by-site basis, based on potential for successfully restoring the site. Effects are expected to be limited and some restoration is anticipated.

All proposed actions for the live oak community would take place in the Curry Village area. Each alternative involves a small amount of restoration and a small amount of redesign in live oak habitat. Both are positive effects.

The construction of a new group camp, though it takes place in the mixed conifer community, would decrease the buffer zone between the live oak community and development, a potentially negative influence on this community. Design of the site would attempt to mitigate potential impacts.

Conclusion — A total of 2,576 acres of upland communities would remain relatively unaffected in Yosemite Valley; 64 acres would remain disturbed, 49 would be developed, and 115 acres would be restored.

Rare, Threatened, Endangered, and Sensitive Plant Species. There would be no known effect on sensitive plant populations.

Wildlife

Alternative 2 would result in restoration of some important habitat in Yosemite Valley's east end but would cause degradation of other habitat in the west end where human/wildlife conflicts have been minimal. Restored riparian habitat would possibly benefit willow flycatchers and many other bird species that use deciduous trees in these areas. The aquatic ecosystems would benefit from enhanced nutrient flow from riparian and meadow areas. Restoration of meadows would benefit native amphibians and increase habitat suitability for great gray owls but could also improve conditions for nonnative bullfrogs. Restored forest and woodland areas, such as the Rivers Campgrounds, would provide blocks of habitat that would benefit small mammals and birds but would probably not be large enough to benefit larger species such as black bears and mountain lions. Development proposed at Taft Toe as part of this alternative would impact mixed conifer habitat, which could affect species such as the California spotted owl, Cooper's hawk, and long-eared owl. This new development would also provide new opportunities for wildlife to be exposed to human food unless food storage facilities, education, and enforcement are provided. Adjacent forest, riparian, and meadow habitats would be affected by increased human use associated with Taft Toe development.

Restoration of apple orchards in east Yosemite Valley to natural habitat would eliminate this unnatural food source for wildlife, which would reduce human/wildlife conflicts and alteration of wildlife ecology.

The portion of Camp Six now used for concession housing, visitor parking, and construction spoils is now almost totally useless to wildlife. It also serves as a source of human food for black bears. Restoration of this area would provide wildlife habitat. The area just beyond the fence is unspoiled riparian and wetland habitat, so restoration of the larger disturbed area would increase the value of this area to wildlife.

Cumulative Effects — Restoration of habitats in east Yosemite Valley would return some of these areas to wildlife use for the first time in decades. Much of the development to be removed was constructed without regard for sensitive or scarce habitats and wildlife. Since the reductions in numbers of overnight accommodations (lodging and campground units) are not a major proportion of the previous totals, levels of human/bear conflicts would continue unless stepped-up education and enforcement is provided. Sites of new development in west Yosemite Valley include previously undisturbed areas, historically disturbed areas, and areas currently disturbed.

Conclusion — The net gain in meadow, riparian, and mixed conifer habitats in east Yosemite Valley would also result in a net beneficial effect on many wildlife species that use these habitats. Such benefit would generally be positively proportional to the size of restored habitat blocks and negatively proportional to the size of the wildlife species that use them. New development in west Yosemite Valley would impact mixed conifer habitat and provide a new site for human/wildlife conflicts.

Merced River Scenic and Recreational Values

There would be 130 acres restored in the river corridor, 49 acres would be redesigned, and 50 acres would have new development.

Scenic, recreational, air quality, biotic, and hydrological processes would be improved. The most significant effects on the scenic values of the Merced River under this alternative would be removal of development and the reduction of resource impacts along riverbanks and in aquatic areas. After campgrounds were pulled back away from the river to create the river management zone, recreational activity would be directed to more resilient sites for fishing, swimming, and other activities. This would

improve scenic, biological, and recreational quality by establishing more natural riparian and aquatic communities and increasing shade.

The removal of Sugarpine, Ahwahnee and Stoneman Bridges would reduce the amount of development in the riparian corridor, increasing the naturalness of the scene.

Cumulative Effects — Impacts from campgrounds, bridges, and development would be reduced along the Merced River, and the effects on the river would be greatly reduced, creating a more natural scene.

Conclusion — The amount of riparian area affected by visitor impacts and development would be reduced substantially through the restoration of 130 acres in the river corridor, improving scenic quality.

Water Resources

Hydrology. The hydrology of the Merced River would be improved more than in any other alternative. With the removal of Sugarpine, Stoneman, and Ahwahnee Bridges and some of the associated riprap, three major constrictions along this stretch of the river would be removed.

Of the three bridges, removing Sugarpine Bridge would have the most benefit to the Merced River. This bridge constricts the river by about 50%, increasing the amount of water diverted into an overflow channel each year. If erosion continued to cut the overflow channel, it would eventually become the main channel. Removing this bridge would eliminate these impacts.

The removal of Stoneman Bridge would reduce flow constriction, currently estimated at 50%. This constriction causes erosion of the bank and riverbed downstream. Removal of the bridge would reduce scouring. The bridge cannot accommodate high flows, so water backs up behind the bridge and creates severe erosion upstream. The upstream erosion would be eliminated by removal of the bridge.

The Ahwahnee Bridge constricts the Merced by approximately 25%. Removal would eliminate

TABLE 32: RIVER VALUES

Outstandingly Remarkable Values	Impacts
Scenic	Views of waterfalls, rock cliffs, black oak woodlands, and vistas would be enhanced by the removal of some of the development in the 100-year floodplain, including campsites and bridges.
Geological	No impact would occur.
Air Quality	Hydrocarbons, carbon monoxide, and oxides of nitrogen would decrease. Overall air quality would improve as a result of the reduction in numbers of private vehicles.
Recreational	Hiking, picnicking, camping, fishing, photography swimming, nature study, horseback riding, biking, and sightseeing would all be enhanced by removing structures in the river corridor.
Biological	Biotic communities, particularly riparian areas, would be enhanced by removing most development in the river corridor. Neotropical migrant songbirds and some rare bat species would benefit.
Cultural	Removal of three bridges would impact the cultural scene.
Hydrological	The natural flood regime and hydrological processes of the Merced River would be enhanced by removing bridges and most structures and campgrounds in the river corridor.

scour and allow for more natural hydrologic processes. Removal of the bridges would enhance the flow capacity, sinuosity, slope, and sediment transport of the river at these locations. The removal and restoration of areas in the floodplain would allow for a more natural river flow throughout the east end of the valley.

The removal of campgrounds, buildings, and fill at Camp Six and at campsites in Upper and Lower Rivers and Lower Pines Campgrounds would allow the river and its tributaries to function naturally by forming braided river channels and broad floodplains. The river would benefit by increasing its geomorphic diversity and ability to dissipate energy during peak discharge periods.

Seasonal watercourses and tributaries could be manipulated to accommodate development in the Taft Toe area, though the flood regime of the Merced River would not be affected. Impacts on tributaries could be mitigated by a design sensitive to water flow patterns. Utility and sewer lines might have to cross the Merced River, causing short-term construction-related impacts.

Water Quality. The concession stables would be removed, eliminating one potential source of water contamination. The creation of a Merced River management zone would protect erodible banks and reduce erosion-related contamination.

Cumulative Effects — Effects on hydrology and fluvial processes, which are crucial in sustaining the ecosystem dynamics in Yosemite Valley, would be greatly reduced compared to the levels in the no-action alternative.

Conclusion — Effects of development and human activity on water resources would be greatly reduced by the removal of three bridges and relocation of campgrounds and structures.

Air Quality

Emissions under this alternative would be less than under no action. Day use vehicles would come from gateway communities and would not enter the east end of Yosemite Valley. Beginning at the transfer facility at Taft Toe, all day use visitors would move about the valley on park shuttle buses. Overnight visitors would park their vehicles at lodges or campgrounds for the duration of their stays, which would reduce vehicle use and emissions.

Electric buses are preferred for future use in Yosemite Valley because of their low levels of emissions and operating noise. These buses are not as available for fleet purchase as buses using natural gas and diesel fuel, but two are already in use in the valley. At present, the park's shuttle bus fleet is almost entirely diesel-fueled, but the vehicles are old and should be replaced. When they are replaced, alternative fuel buses would be preferred. Since alternative fuels could reduce emissions, this would be a positive effect. Their operation results in virtually no onsite emissions. Buses using compressed natural gas and diesel fuel were modeled to assess their emissions, which are listed below.

TABLE 33:EMISSIONS SUMMARY FOR ALTERNATIVE 2, TAFT TOE PARKING SCENARIO, USING COMPRESSED NATURAL GAS BUSES

Pollutant (tons/ year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	178.0	(-11%)	88.0	(-2%)
CO	1,434.0	(-15%)	236.0	(-10%)
NO_x	189.0	(-5%)	74.0	(-5%)
PM	3.7	(-3%)	2.4	(-3%)
SO_2	7.9	(-5%)	6.6	(-5%)

Source: EA Engineering, 1996

Emissions for the scenario under which day use visitors would park at Taft Toe and use diesel buses to move about Yosemite Valley are listed in table 34. All emissions are less than under no action. In 2015 NO_x emissions would be greater than no action (at 1995 use levels), but emissions of all other pollutants would be less.

With implementation of a regional transit system, day use visitors would be transported from the gateway communities to Taft Toe,

TABLE 34: EMISSIONS SUMMARY FOR ALTERNATIVE 2, TAFT TOE PARKING SCENARIO, USING DIESEL BUSES

Pollutant (tons / year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	174.0	(-13%)	83.0	(-7%)
CO	1,431.0	(-15%)	232.0	(-11%)
NO_x	192.0	(-3%)	77.0	(+5%)
PM	3.7	(-3%)	2.4	(-4%)
SO_2	8.2	(-1%)	6.8	(-1%)

Source: EA Engineering 1996

where they would transfer to shuttle buses. With either fuel scenario, emissions would be less than under no action, except for NO_x emissions. NO_x would be greater by 2015 (5% increase for diesel; 5% decrease for compressed natural gas). At that time, diesel buses would probably have less VOC and CO emissions, while the compressed natural gas buses would have less NO_X, PM, and SO_2 emissions.

TABLE 35: EMISSIONS SUMMARY, GATEWAY STAGING SCENARIO, USING DIESEL BUSES

Pollutant (tons/ year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	107.0	(-46%)	48.0	(-46%)
CO	747.0	(-55%)	131.0	(-49%)
NO_x	163.0	(-18%)	112.0	(+52%)
PM	2.1	(-44%)	1.4	(-44%)
SO_2	6.8	(-18%)	5.8	(-16%)

Source: EA Engineering 1996

TABLE 36: EMISSIONS SUMMARY, GATEWAY STAGING SCENARIO, USING NATURAL GAS BUSES

Pollutant (tons/ year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	136.0	(-32%)	77	(-14%)
CO	765.0	(-54%)	164	(-37%)
NO_x	132.0	(-33%)	82	(+12%)
PM	2.0	(-47%)	1.3	(-48%)
SO_2	4.4	(-46%)	3.2	(-54%)

Source: EA Engineering 1996

Cumulative Effects — The greatest influences on air quality in the Yosemite region would continue to be from sources outside of the park and adjoining counties. A transit system in the valley would reduce emissions under all scenarios, which would result in a reduction in pollutants in the region. The elimination of parking at many popular attractions and the resulting reduction in exhaust fumes would improve the quality of the visitor experience. Campfires would continue to have significant direct and localized effects on air quality.

Conclusion — The reduction in automobiles and the reliance on transit buses for movement about the valley would result in a reduction in vehicle emissions in Yosemite. The visitor experience would be improved at major attractions.

Scenic Resources

The view from Glacier Point would be improved by restoring about 134 acres of previously developed areas in its viewshed. Specific improvements would result from the recovery of Camp Six, redevelopment of the maintenance area as housing, restoration of the river corridor, redevelopment of camping facilities, and removal of roads from Stoneman and Ahwahnee Meadows.

In the *General Management Plan* 11 vistas were identified as most important in the valley. Table 37 lists the specific impacts on each vista; table 38 lists the impacts on vista points from which most visitors experience these views.

Cumulative Effects — Yosemite Valley remains one of the premier landscapes in the world. The amount of intrusion into viewsheds would be reduced compared to the no-action alternative because of the reduction in development.

Conclusion — Alternative 2 would improve the scenic quality of Yosemite Valley by removing 147 acres of development. Views from most of the valley's eastern viewpoints would be significantly improved. Views from some of the valley's western viewpoints (Dewey Point and Taft Point) would include the Taft Toe transit facility, which would be designed with conifer buffers. Islands would be retained for screening.

TABLE 37: IMPACTS ON VISTA POINTS

Vista Point	Impacts
Discovery View (Tunnel View)	none (see photo)
Bridalveil straight-a-way	none
Valley View	none
Dewey Point	Taft Toe transit facility visible
Taft Point	Taft Toe transit facility visible
Upper Yosemite Falls	Approximately 108 acres of restoration
Sentinel Dome	Improved by removal of development in the valley
Glacier Point	Approximately 108 acres of restoration in the viewshed from Glacier Point; new group camp visible at base of wall
El Capitan meadow	Crowding and traffic; Taft Toe not visible (see photo)
Chapel straight-a-way	none
Sentinel Bridge	none
Four-Mile Trailhead	none
Columbia Point	None
Lower Falls View	Improved by removal of adjacent vehicles and redesign of area
Cook's Meadow	Improved by removal of residence #1 and reduction of vehicles along the road to the north

TABLE 38: IMPACTS ON SCENIC VISTAS

Scenic Vistas	Impacts
Yosemite Falls	Views from the village area would be improved by removal of some structures from the village and restoration of those areas to more natural conditions. Views from Stoneman Meadow would be improved by removal of the road and the bridge.
Sentinel Rock	There would be no impact on scenic vistas of Sentinel Rock
Glacier Point	Views would be improved by removal of development in the valley.
Half Dome	Views would be improved by removal of residence #1, Stoneman Meadow and Ahwahnee Meadow Roads, and Ahwahnee Row houses.
North Dome	There would be no impact on vistas.
Royal Arches	Vistas near Ahwahnee Meadow would be improved by removal of the tennis courts.
El Capitan	Wilderness views from the far south rim of the valley would be impacted by the Taft Toe transit facility; design would mitigate the impact.
Bridalveil Falls	There would be no impact on vistas.
Cathedral Rock and Spires	There would be little influence on vistas, but the view from Taft Toe would be in the context of a transit facility.
Washington Column	The view from the new campground at Lamon orchard would be impacted.
Three Brothers	This feature is visible from the Taft Toe area, and the view would be in the context of a transit facility; design would mitigate the impact.

Noise

Vehicle noise would be lessened because day use visitors would not be allowed to drive into the east end of Yosemite Valley. Driving in and out by way of Southside Drive would be limited to visitors staying overnight in campgrounds and lodging units, transit buses carrying day use visitors from the transfer point, and service/ delivery vehicles. All visitors would be required to use the valley circulator shuttle system to move between services and attractions. The dominant noises along roads would be from the shuttle buses that would run on regular schedules.

Peak noise levels for all vehicle types would be similar to the no-action alternative, but the number of vehicles would change. At the Four-Mile trailhead, for example, the combined number of entering and exiting automobiles (less than 1,000), shuttle buses (260 to 390 round trips per day), and service delivery vehicles would be less than 30% of present traffic levels. Shuttle buses to and from the transfer station would pass any given point along Southside Drive approximately every 30 to 45 seconds. Electric transit buses, if used to shuttle visitors from the transfer point to all points in the east end of the valley, would pass the Four-Mile trailhead approximately every 20 to 30 seconds. This would equate to more periods at ambient sound level. Vehicle noise levels at the Taft Toe transit facility would be comparable to those currently found at the village shuttle stops, which are similar to those on Southside Drive.

At popular attractions, sounds from automobiles and motor coaches would be less of a factor than in the no-action alternative, as all visitors would access these places by circulator shuttle buses. With 1-minute stops, shuttle buses could be heard approximately 50% of the time. Whether the noise from buses could be easily distinguished from background sound would depend in large part on whether buses were electric, compressed natural gas, or diesel powered. Periods of natural quiet or background sound from waterfalls and river would be more common than under the no-action alternative, a positive effect.

On the portions of Northside Drive that would be converted to bicycle and pedestrian trails, noise levels would be reduced significantly. Natural sounds and quiet would dominate.

Cumulative Effects — The reduction in numbers of vehicles in Yosemite Valley would allow a reduction in the numbers, capacity, and extent of roads and parking sites and a reduction in vehicle noise. There would be more vehicle-free zones and more natural quiet than under the no-action alternative.

Conclusion — Reducing the number of vehicles and converting to electric shuttle buses would bring about a major improvement in the character of the valley. Compared to the no-action alternative, most locations would experience more time at ambient noise levels.

IMPACTS ON THE CULTURAL ENVIRONMENT

Archeological Sites

Up to 28 archeological sites would be directly affected by actions such as construction of new facilities (structures, roads, bicycle paths, campgrounds, picnic facilities), demolition of facilities, and environmental restoration. Impacts on 22 of these sites would be different than prescribed in the 1980 *General Management Plan*. These effects include direct impacts such as ground disturbance, which removes or disturbs artifacts and features, resulting in loss of information. Indirect impacts include development close to sites, which increases surface collection and soil compaction. Generally, direct effects are classified as adverse. These effects can be partly mitigated by careful planning and site excavation. Utility construction would have the most direct impact on archeological sites. Outside of new actions, 57 archeological sites would continue to be affected by existing facilities. These sites would continue to degrade through visitor use, surface

collection, and maintenance and repair. This degradation could be mitigated by a coordinated program of site monitoring, stabilization, and data recovery.

The 28 archeological sites in the area to be affected are classified by site type (large village, 9; small village, 3; house sites, 8; large camps, 4; and historic, 4). Sites with the potential to yield important information include: 1 exceptional, 11 high, 10 moderate, and 6 low. If activities were to take place without data recovery efforts, effects would be adverse.

Several areas that are likely to contain undocumented or buried historic era archeological material would be affected by proposed actions. Prior to site design planning, detailed archival research, field documentation, and resource evaluation would be conducted. Effects of construction would be minimized where possible through careful site design. Unavoidable effects would be mitigated by archeological data recovery.

Environmental restoration would take place at six sites. Depending on the type of restoration activities and extent of surface disturbance, surface and subsurface artifacts and features could be affected, resulting in loss of information and site integrity. These impacts would be mitigated with careful planning and data recovery where necessary. Long-term preservation of remaining site constituents would be enhanced.

Cumulative Effects — The total cumulative impacts on archeological sites would be less than under the no-action alternative. The consequences of disturbing the archeological sites could be moderate to significant loss of archeological information, which could be partly mitigated through careful planning and data recovery.

Conclusion — A total of 85 sites, 80% of the documented sites in Yosemite Valley, would be either directly affected by new action or would continue to degrade. Long-term preservation would be enhanced at three sites.

American Indian Traditional Cultural Properties

An American Indian cultural center (with roundhouse and umachas) could be constructed by American Indian groups, possibly making the valley and its traditional cultural resources more accessible to individuals. This would allow them to continue their association with Yosemite Valley and to be involved in traditional practices.

No effects on traditional cultural properties are anticipated beyond those in the no-action alternative. In the implementation of this alternative, the NPS would work with American Indian communities to identify and avoid or mitigate impacts.

Cumulative Effects — Over the years adverse effects on traditional cultural properties have occurred throughout Yosemite Valley, yet it retains many sites and resources of significance to the American Indians who retain a meaningful relationship with the valley. This alternative would result in less development and maximum restoration of natural areas in Yosemite Valley. Removal of facilities and restoration is supported by American Indians who believe that the actions would improve the traditional value of the area.

Conclusion — No effects on traditional cultural properties would be anticipated beyond those listed in the no-action alternative.

Historic Sites, Structures, and Buildings

All management, preservation, and maintenance actions for historic districts and national register-eligible and listed structures would continue as under the no-action alternative.

Yosemite Village Historic District

As in the no-action alternative, the structures that would be removed under this alternative would include the superintendent's residence

and garage, the Ahwahnee Row houses and Lower Tecoya concession housing, the concession headquarters and garage complex, and many structures in the NPS maintenance area. The park headquarters would be adaptively used, as called for in the *General Management Plan.* The effects would be similar to the no-action alternative (as prescribed in the GMP and section 106 consultation process).

The administration building (HB 575), museum building (HB 576), girl's club (HB-57, 58, and 59) and residence 70 (HB70), which are contributing elements of the national register district, would be adaptively used. These structures would have changes that would not affect their character-defining features. Other historic structures in the district would be preserved and maintained. *The Secretary of Interior's Guidelines for Rehabilitation* would be used.

Ahwahnee Hotel

None of the buildings would be affected, but two elements of the designed landscape would be altered (see cultural landscapes).

Camp Curry

Most changes to structures would be the same as under the no-action alternative. The removal of the Curry orchard would be an adverse effect and would require mitigation measures, including documentation. The old Curry registration office would be adaptively used, with alterations consistent with the *Secretary of Interior's Standards for Rehabilitation.*

Curry Stables and Lamon Orchard

The concessioner wants to discontinue trail rides from the valley. Because of the need for space for campground replacements, the Curry stable and Lamon orchard would be removed. This would be an adverse effect and would require mitigation, including documentation.

Yosemite Valley Bridges

Three national register-listed bridges (Ahwahnee, Sugarpine, and Stoneman) and their associated rip-rap would be removed under this alternative. This would be an adverse effect and would require mitigation, including documentation.

Cumulative Effects — The effects of implementing this alternative would be similar to that of implementing the no-action alternative. The result would be an irretrievable loss of historic property throughout the valley. This loss would not eliminate whole districts but would result in the loss of elements within districts. Many of these structures would be adaptively reused, altering their function but preserving historic fabric. Many structures would continue to be used as originally designed and in districts that retain much of their character.

Conclusion — The effects on historic structures would be greater than under the no-action alternative. Three bridges (Sugarpine, Ahwahnee and Stoneman) and Curry orchard would be removed in order to remedy natural resource-related problems. The result would be an irretrievable loss of historic property throughout Yosemite Valley.

Cultural Landscapes

Yosemite Village. The landscape would be managed to promote visitor information, and additional buildings would be converted to that function. Administration and visitor garage functions would be moved from the valley. This alternative would be similar to the no-action alternative in its effects on landscape elements of the visitor services/administrative core area and the residential area in the Yosemite Village historic district, except that a comprehensive design would be employed. Changes to the Village Store would not be a significant effect. The removal of the concession garages, the buildings in the NPS maintenance, service, and storage area, and Lower Tecoya housing (including the Ahwahnee Row houses) would be

an adverse effect, similar to the effects of the no-action alternative. Removal of the visitor center would have a positive effect in that its design is incompatible with the historic district.

Changes to the landscape and circulation around the visitor arrival and meadow area would not be a significant effect due to the number of past alterations.

Ahwahnee Hotel. The effects under this alternative would be similar to the no-action alternative for the main building, bungalows, visitor approach, and most of the design, vegetation, and landscaping on the grounds. The landscape would be managed in such a way that the integrity of principal landscape features and character areas would be maintained. It could be possible to make parking and circulation improvements using elements of the Olmstead firm's original designs and to integrate some of the area currently used for employee parking. Otherwise, this action would have an adverse effect on the design. The tennis courts would be removed, and the swimming pool would be retained. Both actions would vary from the original design, but the loss of the tennis courts is believed to be appropriate. The removal of the employee housing would not be a significant effect since it postdates the period of significance and integrity is low.

Curry Village. The landscape would have refinements to circulation, lodging, and services. The reduction in tent cabins and the resulting improvement to circulation around the units would have a positive influence on the district and would be closer to historic density levels. The wooden bungalows would be retained, but additional units would be added, thus adding elements that postdate the period of significance. Architectural character guidelines would help to limit the effects of the new units. Refinements to visitor services and the administrative core would not have a major effect on integrity since this area has had numerous changes over the years. The refinements to the visitor arrival area, which has greatly diminished integrity, would not be a significant effect. The removal of the orchard, which possesses considerable design integrity because it retains many features from the period of significance, would be an adverse effect and would require mitigation. The removal of the employee housing units, including Huff House, would mean the loss of some historic integrity.

Yosemite Valley. Prominent landscape features such as meadows and the Merced River would be enhanced by moving or removing other landscape features, including roads, campgrounds, and bridges. These removals would alter visitor circulation and, in some places, visitor access to the landscape. These removals may be an adverse effect on historical circulation patterns, which help define the cultural landscape.

Since most campgrounds have had several alterations over the years, redesign would not have a significant effect. The removal of Upper and Lower Rivers and portions of Lower Pines Campgrounds would be a change from historic conditions.

The removal of the concessioner stables and Lamon orchard would mean a loss of historic properties that retain considerable integrity and would differ from GMP provisions for the site but would implement the *Concession Services Plan*. The removal of the superintendent's residence (residence 1) would be the same as in the no-action alternative. Residence 1 has been inundated on several occasions, most recently during the January 1997 flood.

The condition of the Merced River and its tributaries would improve as development was removed from the floodplain and activity focused on more resilient areas. The removal of three bridges would mean a loss of significant landscape features, which would be an adverse effect. The new bicycle bridge near Housekeeping Camp and new bridge at a walk-in camp would not have significant effects on the landscape.

The condition of meadows would improve, but the removal of landscape elements related to road circulation would alter the visitor's access

to them in Stoneman, Ahwahnee, and Cook's Meadows. The loss of these roads and bridges would mean a loss of historic circulation integrity. New segments of the pedestrian, bicycle, and bridle paths would be added to maintain circulation, and portions of the original Loop Trail would be retained. The effects on circulation would be considered adverse, but many historic segments would remain intact.

Cumulative Effects — Despite changes over the years and the changes proposed in this alternative, each cultural landscape retains many significant character-defining features that remain relevant today as originally designed or as modified to meet modern needs. Cultural landscapes in Yosemite Valley would continue to be governed by design that is intended to be appropriate to place.

Conclusion — Effects on cultural landscapes would be greater than under the no-action alternative, since three bridges, road segments, and Curry orchard would be removed. These adverse effects would result in irretrievable loss of some historic properties.

Collections

Impacts on the park museum, library, and archival collections would be limited to the risks associated with moving such resources from one location to another. New facilities would provide much needed space for collections storage and management as well as controlled environments that would eliminate damage from insects and animals and provide protection against fire and theft. Visitor use and enjoyment of the collections would be greatly enhanced.

IMPACTS ON VISITOR USE AND INTERPRETATION

Because this alternative would significantly reduce crowding in the valley and remove the majority of vehicles, it would have a profound impact on the visitor experience. Views of eastern Yosemite Valley from the valley floor and higher elevations would be more natural, with fewer built intrusions and less traffic. Day users and some high elevation users would observe the new development in the western valley. The restoration of meadows and riverbanks, the management of forests, and the removal of crowded developments and park operations facilities would reveal a more natural scene.

Access in this alternative would be by shuttle bus; personal automobiles would be left at the west valley parking area or at campgrounds and lodgings. Shuttle bus travel could pose problems for visitors with recreational equipment. Visitors with disabilities could find access more difficult because of the need for transfer from personal to public transportation and the distance between shuttle bus stops and destinations. The new parking and transit facilities would simplify visitor entry and would allow visitors to sightsee during the shuttle trip. There would be no significant increases in travel time compared with alternative 1.

Construction activities in Yosemite Valley during VIP implementation could inconvenience park visitors and interfere with their overall experience. The level of disruption resulting from VIP implementation would depend in large part on how the construction process was managed. By scheduling construction material deliveries to avoid peak visitation periods, organizing traffic controls, and communicating information about access disruptions to visitors prior to arrival, the National Park Service should be able to minimize impacts on visitors during VIP implementation. Despite such planning, however, it is unlikely that potential adverse impacts on visitors could be fully mitigated.

Given the historically high demand for Yosemite visitation, it is anticipated that any displacement of park visitors due to the VIP-related construction would be replaced by visitation by those less concerned with construction effects. The displaced visitors would have the option of visiting during the winter and shoulder seasons when construction work would be minimal or stopped altogether. Consequently, implementa-

tion impacts on visitation are expected to be insignificant.

The visitor experience while VIP-related construction is in progress should not be greatly diminished. Most of the proposed construction should not create excessive noise or affect access greatly. For example, the proposed information/transfer facility is in an area far from where most visitation concentrates.

Visitors choosing not to visit Yosemite during the VIP construction period would not be permanently affected, since construction is only temporary. The 5-year construction schedule could be more disruptive to park visitation due to the larger scope and shorter duration than the 10-year construction schedule in alternative 1.

Information / Orientation

Information services would be located in two primary transportation centers (the west valley orientation/transfer facility and the interpretive center/ transit station in the village), which would increase their visibility. This would afford all park users much easier access to information, wayfinding, and park orientation. A campground information and orientation center and information boards at all campgrounds and in every lodging center would serve overnight guest information needs. Visitors would find it easy to use the transit system, to plan visits, and to find destinations. This would result in increased visitor satisfaction.

Interpretation

The development of a new interpretive center/transit station at the village and the two new museums in the administration and old museum buildings would allow comprehensive interpretation of all of the park's resources for all visitors. Many of the park's values have been presented to overnight visitors in evening interpretive programs, but comprehensive interpretive media has been unavailable to most users. Additional visitor center and museum space would allow visitors to experience interpretive media (exhibits, audiovisual programs, ranger-guided programs) at convenient times and in depth. The new natural history museum and a new interpretive facility at Yosemite Village would provide onsite interpretation. Visiting the museums would become a more viable recreational option as a result of the transit system, which would eliminate traffic jams in the village area and searches for parking.

Improvements in and around the Indian Village of Ahwahnee would provide both enhanced interpretation and a much quieter environment. The new American Indian cultural center west of Sunnyside Campground would add further opportunities for understanding and enjoyment.

The rehabilitation of the two visitor center auditoriums would provide a place for films and slide shows about all aspects of the park, lectures and symposiums for special groups and specific interests, live presentations in the performing arts, and evening programs. The removal of the old visitor center exhibit area would make the auditoriums visible, easy to find, and inviting. The addition of a fire circle and amphitheater would help to define this area as a center of interpretive programming.

A small new interpretive facility at the approach to Yosemite Falls would facilitate onsite interpretation of several of Yosemite's most compelling stories, an interpretive opportunity available to nearly every day and overnight user. The winterized nature center would provide a year-round focal point of interpretive activity at Happy Isles and an indoor facility for natural history interpretation for the Yosemite Institute and other school groups.

Personal interpretive programs would become more appealing due to reduced traffic, congestion, and noise. These programs would be expanded to serve visitors no longer touring the east valley in their own vehicles. The concessioner-operated tram tour would lose access to the rehabilitated section of Northside Drive and would be impacted by the two-way traffic pattern on Southside Drive, where the ability to

slow down or stop would be only at designated tram turnouts. This tour would become more popular as it would be one of the means of access to the east valley for day use visitors and a principal means of interpretation of the valley between Taft Toe and Sentinel Bridge.

Outdoor exhibits have been oriented toward automobile users, but only a handful of them would become less accessible. And, like the self-guiding interpretive trails, the exhibits would be experienced in less crowded and quieter environments more conducive to contemplation and understanding. New wayside exhibits would be added and oriented to pedestrians and bicyclists, particularly on trails linking the west end transit facility to the east end of the valley. Visitors wishing to tour the valley without the benefit of a guide would find new exhibits and gain greater understanding and enjoyment of valley features.

A new valley facility (previously the NPS maintenance area) for the library, archive, and museum collections would provide for their management, care, and preservation. They would be available for use for the first time. Casual users would enjoy the increased availability of these resources.

Two new amphitheaters would be built in the campground complex. The distance of facilities from some sites might initially decrease attendance at programs but could eventually increase attendance due to consistent scheduling.

Recreation

Auto touring would no longer be available. Quick tours of the valley's scenic and historic features would not be possible, and sites between the established bus stops would be more difficult to access. Spontaneity in visit choices would be reduced, and visit planning would be more important. Time spent in waiting and travel between valley destinations could be increased, but time spent in wayfinding and searching for parking would be eliminated.

Visitors with disabilities would use appropriately equipped park shuttle buses to move about the valley, leaving their vehicles at the west valley staging area, and departing at visitor services, major destinations and other sites. This provision would introduce an inconvenience for some and a provision of access for many.

Bus touring would become a primary method for sightseeing and would include the valley shuttle system and concession-operated trams. The number of guided tram tours could increase. Sightseeing on these buses would be effective for interpretation and efficient in terms of visitor ease, safety, and ability to focus on the sights. Visitors who choose to sightsee on the valley transit system might have a less satisfactory experience due to peak period crowding.

Traffic noise, confusion, crowding, and visual distractions would be reduced throughout the valley, except at the west end transit facility. Relaxation would be possible almost everywhere. Shopping would be an easier and more pleasant experience without parking and traffic worries. Purchases, however, would have to be stored in a locker or carried for the remainder of the day's activities, unless a trip back to campsite, lodging, or transit center is made.

Strolling, walking, and sitting would become significantly more pleasant and rewarding as the valley environment improves. Transit system limitations would encourage or require walking, while conditions for recreational strolling and sitting would be improved by reduced pollution and noise. Walking safety would be greatly improved except when walking paths are shared with more bicyclists. A new hiking and biking trail along the rehabilitated Northside Drive would provide for hiking in a large motor vehicle-free area. The removal of Stoneman, Ahwahnee, and Sugarpine Bridges would make some walking routes longer. The anticipated increase in walking could cause environmental damage adjacent to well-traveled routes.

This alternative would provide much better access to trails for hikers, particularly campers. The transit system would allow hikers to reach

trailheads without struggling through traffic and finding a parking place. Overnight hikers would carry packs on the shuttles. In some instances, hikes could be a bit longer because shuttle bus stops might be further away. Increased hiking increases the likelihood of off-trail travel, which may be further increased by crowding on popular hiking and biking trails.

Backpacks would have to be transported longer distances on shuttles to reach trailheads. Increased use of hiking or bicycle trails and placement of campgrounds close to climbing areas would allow increased and prolonged contact between the climbing and nonclimbing public. Climbers would have to transport their equipment on the valley transit system. Access to climbs would be by foot, bicycle, or shuttle; climbing areas closer to developed areas could have increased use. Climbers on El Capitan, Three Brothers, Sentinel Rock, Cathedral Spires, Cathedral Rocks, and routes in-between would look down on the Taft Toe facility, which would be designed with conifer buffers and islands to provide screening.

Campground tiers would be established to specifically accommodate walk-in camping, car (tent) camping, and combined recreational vehicle/tent use. Each distinct zone would be separated by a river. This change would positively affect many campers who seek specific camping qualities, such as quiet or less developed campgrounds. This would be true of many individuals who prefer walk-in camps but not necessarily true of campers using recreational vehicles. Some might see the arrangement as a loss of freedom and discretion.

Removal of the Rivers Campgrounds would result in the loss of these very popular campsites but would remove sites from the floodplain and restore the riverbank, which would be a significant improvement in the visual environment. The river would be accessible to all visitors for their enjoyment, but access routes would be directed at more resilient sites, reducing visitor discretion. Restoration of the riverbank at Rivers, Lower Pines and North Pines Campgrounds would significantly improve the visual environment and visitor experience. Relocating the Group Camp would allow improved access, and sites would be closer to the transit system and stores, a positive effect.

Some riverside campsites would be removed at Upper Pines, but the entire campground would be expanded to provide increased capacity in partial compensation for the loss of sites at other locations. Campers would have good access to interpretation and information services and to a camp store. The restoration of the riverbank would provide an improved environment.

At Lower Pines camping density would be reduced by removing sites from the floodplain. These are popular sites, but their removal would result in less crowding and the restoration of the riverbank. An improvement in the overall camp environment could result. New sites would be developed that would require the removal and relocation of the amphitheater.

North Pines Campground would be redeveloped and expanded. Sites would be removed from the floodplain and the riverbank. A new area would be built for walk-in campers, separating differing camping styles. Areas where sites were removed would be restored to natural conditions, improving the general environment of the campground.

Private cars would be unavailable for transporting and storing picnic food and equipment. This could make picnicking more difficult for some visitors and would change the experience for others.

Picnickers would have to transfer their picnic gear to shuttle buses. This could change the picnicking from coolers and grills to blankets, baskets, and backpacks. Concession food services would probably benefit. Dining and general food service would play a more important role in the valley experience. Longer waits for seating or service could result.

Safety would be much improved for bicycle touring. There would be relatively free access to most roads. In addition, bicycle touring would

be more rewarding because of reduced competition with automobiles. Bicyclists would be able to pay more attention to the park's resources and experience more freedom of movement and flexibility in routes. They could do and see things they could not have done or seen in a car. Increased bicycle use in the west end of the valley could result in resource degradation and conflicts with hikers. This could be mitigated with increased interpretation and enforcement. Where bicyclists would use paths with hikers and walkers, competition and safety could become significant issues. Bicycle rental outlets at both the east and west ends of the valley and at Camp Curry would make it easier for bicyclists to rent and return bicycles and would encourage bicycle touring from the Taft Toe facility.

The restoration of the Merced riverbanks in many areas of the valley would enhance the environment for fishing; more good fishing areas would be available. The continuing proximity of some campsites to the river could cause conflict between campers and anglers. Anglers would find an improved overall experience as a result of the reduction of Northside Drive traffic. They would have to carry their gear on the shuttle to reach fishing locations. Campers accustomed to fishing at campsites would no longer enjoy such immediate access to the river.

Photographers would enjoy the improvements in the valley's scenic views, the reduction in numbers of automobiles, and the improved air quality. Photographers would have to carry equipment and supplies with them on the transit system and while walking to sites. Reduced mobility would reduce and restrict the ability of photographers to respond quickly to changing conditions.

Cross-country skiing would be much improved by the expanded opportunities, increased safety, and improved environment of this alternative.

Restricted river access for swimming would inconvenience some visitors but would protect the riparian and aquatic areas. Effects would be offset by improved scenic values and the restoration of the riverbanks.

It would be convenient for wilderness users to obtain use permits and trip planning assistance.

Transport of hang gliders, skis, and other equipment would be a challenge. Shuttles would be equipped to handle recreational equipment.

Cumulative Effects — Interpretive services would be more central and integral to movements about the valley, since they would be linked to the in-valley transportation network. The reduction in automobiles in Yosemite Valley would greatly improve the quality of the visitor experience and recreational environment. The visitor experience would be more dominated by the valley and available opportunities than by the frustration of dealing with traffic and finding a parking space. Some resource protection and transportation measures would reduce visitor freedom and discretion.

Conclusion — Interpretive services would be improved compared to the no-action alternative. Recreational pursuits would be available in a more tranquil environment. Activity would increase in the west end of the valley, where expanded hiking and bicycling opportunities would be available. Most auto touring would be replaced by recreational activities more directly involved with the resource or by guided tours. The camping experience would be less crowded and more comfortable, but there would be fewer campsites available.

IMPACTS ON SOCIOECONOMIC CONDITIONS

Many of the changes to park facilities, roads, and landscapes proposed under alternative 2 would not be implemented under the no-action alternative (such as the orientation/transit facility at Taft Toe, the removal of the Northside Drive). The National Park Service expects that the additional construction and related work would cost approximately $52.2 million in 1997 dollars or $10.4 million per year over five years (over

the cost of the no-action alternative). Of these expenditures, $43.7 million would be earmarked for construction and project administration and would directly impact the regional economy. It is estimated that this spending would create 261 full time equivalent (FTE) jobs locally for five years. This employment would be generated both directly by onsite construction activities and indirectly by the economic expansion from project labor and nonlabor spending in the region.

Based on recent employment estimates, the creation of 261 new jobs would result in about a 1.1% drop in total unemployment in the affected region — lowering the region's unemployment rate by approximately 0.14% (assuming all the jobs are filled by current residents). Total project-associated personal income gained by area residents would be about $38.5 million or $7.7 million per year over the five-year construction period.

If all of the new construction and construction administration jobs created by alternative 2 were filled by individuals currently residing in the affected region, the population in the area would be mostly unaffected. Given the historically high unemployment in the region there should be a more than adequate supply of local labor. Any housing or local tax revenue impacts would be insignificant. Even in the extremely unlikely event that all the onsite jobs were filled by new migrants to the region, the resulting impacts on the population would be about 0.1% (using 1993 population estimates and assuming that on average, each job would result in two people moving to the area). Many individuals moving to the area during VIP implementation would probably be expected to leave the region following the project's completion.

The proposed improvements and environmental restoration efforts associated with alternative 2 could increase visitor demand for Yosemite visitation by improving the visitor experience at the park.

No quantifiable changes in projections of future visitation at the park associated with the VIP alternatives could be identified. From an analysis of the numerous other factors associated with future Yosemite visitation, it is concluded that other factors could have a significant and uncertain impact on future visitation.

There are some specific differences among the socioeconomic impacts of the alternatives that can be identified and estimated. Significant differences exist in the campsite capacities proposed. The differences in proposed lodging capacities could affect future visitation and the regional economy.

Reconfiguration of the campgrounds in the valley to a total of 675 campsites at Lower Pines, Upper Pines, North Pines, and Tenaya Creek represents a reduction of 81 campsites, which would be a significant decrease in the park's lodging capacity. The impacts could include reductions in park overnight visitation from lost overnight campers and regional impacts of lost visitor spending associated with the excluded campers. These impacts are somewhat offset by the greater construction expenditures associated with the reconfiguration of all valley camping and reduced construction-related impacts on the regional economy.

In the past, there has been high visitor demand for in-park lodging (particularly in the valley). Valley campgrounds generally operate at near capacity. The total number of campsites would be significantly less than before the flood, so considerable unmet demand for in-park camping would be anticipated.

Based on a seasonal campground occupancy rate of 95% and an operating season from mid-April to mid-October (approximately 180 days), the total overnight campsite rentals from the campsites lost would be approximately $13,851 (81 × 180 × 95%).

According to the Gramann survey, the average group size for summer auto visitors to Yosemite is 3.8. Since the majority of the campground visitation occurs during the summer and most campers visit the park by car, this figure has been used to represent the average group size for

campers. The estimate for the total number of person-nights that would be displaced would be approximately $52,634 (13,851 × 3.8). The average per capita daily spending for all overnight in-park visitors is estimated to be $57.52. This average daily spending figure was adjusted downward to reflect lower per capita daily spending on food and lodging by campers when compared to hotel visitors. The average daily per capita spending by in-park campers is estimated to be approximately $33. Using this figure, the displaced overnight visitation by campers would represent lost annual visitor spending of approximately $1.74 million ($52,634 × $33).

In addition to the new campsite construction (to replace campsites destroyed by the 1997 flood), all the campgrounds in the valley would be reconfigured and improved. The total cost for the campground construction is estimated to be approximately $17.9 million more than the campground construction costs for alternative 1. The additional construction spending would provide 73 FTE jobs and approximately $10.8 million in additional income to the region. These construction related economic impacts were included in the overall construction impacts assessed for the alternative.

If there is sufficient excess lodging capacity in the region to accommodate the excluded campers, then local campgrounds or hotels would be expected to capture the lost spending, which would mean that there would be little net loss in spending in the region and a limited net impact to the regional economy. Visitor spending would be transferred from inside the park to the surrounding communities. The camping experience of those displaced from the valley campgrounds could be somewhat reduced, but the past strong demand for overnight visitation suggests that most of the excluded campers would readily accept local accommodations as an acceptable substitute.

Regional campgrounds and hotels generally have very high occupancy rates during the peak season. It is unlikely that they could absorb the demand resulting from lost camping caused by the 1997 flood, and they would definitely be unable to accommodate the additional displacement of campers under alternative 2. Therefore, at least in the short term, it is expected that some visitor spending would be lost.

Over the longer term, lost spending could be recovered by increasing camping and lodging capacity in the region. In the past, the region's lodging capacity has increased to accommodate unmet overnight lodging demand from Yosemite visitors, and there would probably be more increases in the region's lodging capacity to meet any additional demand. Local campground operators could have sufficient lead time to expand operations or open new facilities to accommodate campers that would be excluded from the lost campsites, which would mean that there would be negligible lost visitor spending. Lost construction-related economic impacts would transfer from inside the park to the local region.

Conclusion — In the short term, reducing in-park camping by 81 campsites could result in a net decrease in visitor spending of $1.74 million annually in the affected region. Over the long term, no significant visitor spending is expected to be lost since additional lodging capacity in the region would be expected to develop to recapture unmet overnight visitor demand.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The removal of historic structures and character-defining elements of the landscape would result in an irretrievable loss of these resources. Any loss of archeological sites would also be irretrievable.

Documentation and data recovery efforts would provide mitigation. The level of documentation would be established through consultation with the California state historic preservation office as part of the 106 compliance described in *General Management Plan* and the *Concession Services Plan.*

IMPACTS ON THE NATURAL ENVIRONMENT

Vegetation

Aquatic, Riparian, and Meadow Communities. A total of 22 acres of riparian, aquatic, and meadow habitat would be restored, primarily through the removal of roads in Ahwahnee and Stoneman Meadows, the establishment of the Merced River management zone, and removal of Sugarpine and Ahwahnee Bridges. Additional acreage in Camp Six and along the edge of the Ahwahnee Meadow is expected to revert to meadow and riparian communities over time (see alternative 2).

Six acres of aquatic, riparian and meadow communities would be redesigned and 5 acres developed. Eleven acres near riparian areas would be developed in Upper Pines Campground. A total of 28 acres in this area would be redesigned. The proximity of new sites to riparian areas could increase trampling. This could be minimized through proactive visitor management.

The large connected aquatic, riparian, and meadow zone proposed in alternative 2 (connecting Camp Six through Upper and Lower River Campgrounds) is not proposed in this alternative. The establishment of the Merced River management zone would enhance aquatic, riparian, and meadow communities. The Camp Six restoration would increase aquatic, riparian, and meadow acreage. New exotic plants could invade less area than in alternative 2, because there would be less soil disturbance.

There would be new development in the area of the concession stables and Lamon orchard. This area would not be restored to a natural meadow.

Riparian and aquatic communities in the Pohono Quarry area could receive heavier visitor use. Trampled riverbanks, compacted soil, loss of shrub and herbaceous understory layers, and increased erosion could result, though the riverbank is not as erodible in the Pohono Quarry vicinity as in Taft Toe. Erosion could be partially mitigated by formalizing trails and concentrating use to substrates that are better able to accommodate trampling. The use of the riparian corridor as a wildlife migration route would be hampered.

Highway 140 (the El Portal Road) in the riparian corridor near Pohono Quarry could be moved closer to the river in one location, which could increase road-related impacts in the riparian corridor.

Impacts on Taft Toe would be the same as in alternative 1.

The discontinuation of concession-guided stock tours would reduce erosion and manure (and associated nutrients) on trails in several meadow and riparian communities.

Cumulative Effects — This alternative would represent the first beneficial cumulative effect on aquatic, riparian, and meadow communities since the mid-1800s. Meadows would be reconnected and riverbanks restored.

Conclusion — This alternative would provide major beneficial effects to aquatic, riparian, and meadow communities.

Upland Communities. A total of 117 acres would be restored. Restoration of 105 acres in degraded mixed conifer communities is proposed. The primary restored areas would be in Camp Six, along the perimeter of Upper and Lower River Campgrounds, and North Pines. Much of this area would be restored to meadow and riparian communities.

Redesign in the mixed conifer forest would total 66 acres at Curry Village, Ahwahnee parking, and the area surrounding the concession headquarters. New development in mixed conifer communities would total 37 acres. This

would include the new group camp west of Happy Isles.

Hazard tree removal would be reduced in restored areas and increased around new development. The latter would result in unnatural forest stand structure and composition.

The mixed conifer community would be severely disrupted in the Pohono Quarry area. Some of the overstory would remain, but the shrub and herbaceous understory could be eliminated except for landscaping.

Dumped materials in Pohono Quarry would be cleaned up and deposited in appropriate waste facilities.

Restoration of 2 acres of California black oak woodland would result from the removal of the tennis courts at Ahwahnee Hotel and the road removal in Ahwahnee and Stoneman Meadows. New road realignment in the Curry Village area would impact small sections of oak woodland, though this would allow the restoration of Stoneman Meadow.

The ability of the National Park Service to enhance the quality of California black oak woodlands would remain generally the same as in alternative 1. Reestablishment of oak woodlands would be considered on a site-by-site basis to increase stands, with potential minor benefits.

All proposed actions for the live oak community would take place in the Curry Village area. This alternative involves a small amount of restoration of live oak habitat and a small amount of redesign in the habitat, resulting in minimal enhancement of the plant community.

The construction of a new group camp in the mixed conifer community would decrease the buffer zone between the live oak community and development, potentially increasing vegetation trampling, disturbance to wildlife and human/wildlife interaction.

Conclusion — A total of 2,686 acres of upland communities would remain relatively unimpacted in Yosemite Valley; 72 acres would remain disturbed, and 45 acres would be developed.

Rare, Threatened, and Endangered Plants. There would be no effect on rare, threatened, or endangered plants.

Wildlife

Impacts on wildlife from restoration of habitats in east Yosemite Valley would be similar to those under alternative 2, but less habitat would be restored in the east valley with less resultant benefit to wildlife. There would be impacts associated with an orientation/transfer facility at Pohono Quarry instead of Taft Toe. Similar impacts would be expected on the mixed conifer habitat as a direct result of the development, and indirect impacts could result from increased human use of surrounding areas. There would be increased use and disturbance of adjacent riparian habitats but in a different area. The orientation/transfer facility at Pohono could obstruct wildlife movement along the north side of the Merced River.

Restoration of the apple orchard at Curry Village to natural conditions would reduce impacts on wildlife and threats to human safety and property. The fruit attracts wildlife and is an unnatural food source. The largest apple orchard (near the concession stables) would remain, continuing its wildlife impacts.

Cumulative Effects — Restoration of habitats in east Yosemite Valley would return some of these areas to wildlife use for the first time in decades. Much of the development to be removed was constructed without regard for sensitive or scarce habitats and wildlife. Since the number of overnight accommodations (lodging and campground units) would change little, previous levels of human/bear conflicts would continue unless stepped-up education and enforcement was provided.

Conclusion — The net gain in meadow, riparian, and mixed conifer habitats in east Yosemite

Valley would also result in a net beneficial effect on many wildlife species that use these habitats but to a lesser extent than alternative 2. Such benefit would generally be proportional to the size of restored habitat blocks and to the size of the wildlife species that use them. New development in west Yosemite Valley would impact mixed conifer habitat and could increase human/wildlife conflicts.

Merced River Scenic and Recreational Values

This alternative would restore 113 acres of river corridor; 51 acres would be redesigned, and 48 acres would be developed. There would be a net gain of 85 acres in the river corridor. Scenic, recreational, air quality, biotic, and hydrological qualities would be improved.

Cumulative Effects — As in alternative 2, impacts from campgrounds, bridges, and development would be reduced along the Merced River, and valleywide effects on the river would be greatly reduced.

Conclusion — The amount of riparian area affected by visitor impacts and development would be reduced substantially through the net restoration of 85 acres in the river corridor.

Water Resources

Hydrology. Alternative 3 would remove both the Sugarpine and Ahwahnee Bridges, which would restore more natural hydrologic processes and prevent the current overflow channel from becoming the main channel of the Merced.

Removal of development from the 100-year floodplain would provide more natural river conditions. The natural hydrology of the river would be improved but less than in alternative 2.

Water Quality. Impacts would be the same as in alternative 2.

Cumulative Effects — Effects on hydrology and fluvial processes, which are crucial in sustaining the ecosystem dynamics in Yosemite Valley, would be greatly reduced compared to the no-action alternative but less than under alternative 2. The development and human activities that have negatively influenced the condition and distribution of aquatic, riparian, and meadow communities and the wildlife and fisheries that inhabit them would be directed to more resilient sites.

Conclusion — Effects of human activity on water resources would be reduced compared to the no-action alternative through removal of two bridges and relocation of campgrounds and structures away from riparian areas.

Air Quality

Air pollution emissions would be similar to alternative 2, except that day use visitors would be intercepted sooner, resulting in additional reductions in emissions.

TABLE 39: EMISSIONS SUMMARY, POHONO QUARRY PARKING SCENARIO, USING DIESEL BUSES

Pollutant (tons/ year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	170.0	(-15%)	81	
CO	1,395.0	(-17%)	(-10%)	(-13%)
NO_x	192.0	(-3%)	78	(+7%)
PM	3.6	(-5%)	2.4	(-4%)
SO_2	8.1	(-1%)	6.8	(-1%)

Source: EA Engineering 1996.

Cumulative Effects — As in the no-action alternative, the greatest influences on air quality in the Yosemite region would continue to be from sources outside of the park and adjoining counties. A transit system in the valley would reduce emissions, which would reduce pollutants in the region. As in alternative 2, the elimination of parking at many popular attractions and the resulting reduction in exhaust

fumes from cars and buses would improve the quality of the visitor experience. Campfires would continue to have significant direct and localized effects on air quality.

Conclusion — The reduction in automobile use and the complete reliance on transit buses for movement about the valley would result in a reduction in vehicle emissions — a slightly greater reduction than under alternative 2.

Scenic Resources

The view from Glacier Point would be improved by having approximately 133 acres of previous development restored in the viewshed. Specific improvements to the viewshed would result from the recovery of Camp Six, redevelopment of the maintenance area into housing, and some restoration along the river corridor.

In the *General Management Plan* eleven vistas were listed as most important in the valley. Table 40 lists the impacts on each vista.The scenic quality of Yosemite Valley would be improved by the restoration of nearly 143 acres in the valley. Views from most of the valley's eastern viewpoints would be improved. Views from Tunnel View would include the Pohono orientation/transfer facility, negatively affecting the quality of the view. This would be a major negative effect because no development is currently visible from Discovery View.

Cumulative Effects — Yosemite Valley remains one of the premier scenic landscapes in the world. The amount of intrusion into viewsheds in the east end of the valley would be reduced compared to the no-action alternative because of the reduction in development. The view from Discovery View would include the Pohono orientation/transfer facility.

TABLE 40: IMPACTS ON SCENIC VIEWS

Vista Point	Impacts
Discovery View (Tunnel View)	Views would be impacted by construction of Pohono Quarry orientation/transfer facility; mitigation would be attempted.
Bridalveil straight-a-way	None
Valley View	The Pohono development would be visible from this site; mitigation would be attempted.
Dewey Point	The Pohono development might be visible from this site; mitigation would be attempted.
Taft Point	The Pohono development might be visible from this site; mitigation would be attempted.
Upper Yosemite Falls	None
Sentinel Dome	View from this point would be improved by removal of development in the valley.
Glacier Point	Approximately 60 acres of restoration would occur in the viewshed from Glacier Point.
El Capitan meadow	None
Chapel straight-a-way	None
Sentinel Bridge	None
Four-Mile Trailhead	None
Columbia Point	None
Lower Falls View	Scenic quality would be improved by the removal of adjacent vehicles.
Cook's Meadow	The removal of residence #1 and the reduction of vehicles along the road to the north would improve the view.

TABLE 41: IMPACTS ON SCENIC VISTAS

Scenic Vistas	Impacts
Yosemite Falls	Views from the village area would be improved by removal of some structures from the village and restoration of those areas to more natural conditions. Views from Stoneman Meadow Road at Camp Curry and from Ahwahnee would be unchanged.
Sentinel Rock	There would be no impact on vistas.
Glacier Point	There would improvement of views to Glacier Point by removal of development in the valley.
Half Dome	There would be no impact on vistas.
North Dome	There would be no impact on vistas.
Royal Arches	The vistas from near the Ahwahnee Meadow would be improved.
El Capitan	There would be no impact on vistas.
Bridalveil Falls	There would be no impact on vistas.
Cathedral Rock and Spires	There would be no impact on vistas.
Washington Column	There would be no impact on vistas.
Three Brothers	There would be no impact on vistas.

Conclusion — Alternative 3 would improve the scenic quality of Yosemite Valley through the removal of development. Views from most of the valley's eastern viewpoints would be significantly improved. The Pohono orientation/ transfer facility would be visible from Discovery View, negatively affecting the view. Because of the mass and disturbance associated with parking structures, it would be difficult to mitigate visual impacts at the Pohono orientation facility. Painting and plantings could aid in screening, but the site would still be visible.

Noise

Noise levels would be similar to alternative 2, except that the number of shuttle buses between the west valley transfer point and the village area would increase because of the additional travel distance between the transfer point and the village. There would be a reduction in noise compared to the no-action alternative.

IMPACTS ON THE CULTURAL ENVIRONMENT

Archeological Sites

Up to 23 archeological sites would be directly affected by actions similar to those described for alternative 2. Impacts at 21 of these sites would result from actions differing from those proposed in the *General Management Plan.* Mitigating measures would be similar to those described for alternative 2.

The 23 sites are classified by site type (6 large village, 1 small village, 9 house sites, 3 large camps, and 4 historic). Sites with the potential to yield important information include 1 exceptional, 9 high, 9 moderate, and 4 low. If activities were to take place without data recovery, effects would be adverse.

Several areas that are likely to contain undocumented or buried historic era archeological remains would be affected by proposed actions. Effects of the alternative on these resources would be managed as described for alternative 2.

Impacts include possible partial destruction during construction.

Environmental restoration would disturb three sites. Depending on the type of restoration activities and extent of surface disturbance, surface and subsurface artifacts and features could be affected, resulting in loss of information and site integrity. These impacts would be mitigated with careful planning and data recovery, where necessary. Long-term preservation of the remaining site would be enhanced.

Cumulative Effects — The total cumulative impacts on archeological sites would be less than under the no-action alternative. Disturbing these sites could cause moderate to significant loss of archeological information, which could be partly mitigated through careful planning and data recovery.

Conclusion — Up to 23 archeological sites would be directly affected by new actions or would continue to degrade. Long-term preservation would be enhanced at three sites.

American Indian Traditional Cultural Properties

An American Indian cultural center (with roundhouse and umachas) could be constructed by American Indian groups, possibly making the valley and its traditional cultural resources more accessible to individuals. This would allow them to continue their association with Yosemite Valley and to be involved in traditional practices.

No effects on traditional cultural properties are anticipated beyond those in the no-action alternative. In the implementation of this alternative, the NPS would work with American Indian communities to identify and avoid or mitigate impacts.

Historic Sites, Structures, and Buildings

Yosemite Village Historic District. Actions would be the same as in alternative 2.

Ahwahnee Hotel. Same as alternative 2.

Camp Curry Historic District. Actions would be the same as in alternative 2, except that the old registration building would be returned to its original use and configuration according to the *Secretary of Interior's Standards for Rehabilitation.* The ice rink would be relocated to its historic site southeast of the Curry Pavilion. These actions would be considered restoration of historic function and siting. A small portion of the Curry orchard would be retained for cultural interpretation. The historic area would be altered (the size and layout would be changed) but the resources would be better preserved than in alternative 2.

Yosemite Valley Bridges. Removal of the Ahwahnee and Sugarpine Bridges would be an adverse effect and would require mitigation, including documentation, for the two removed bridges.

Cumulative Effects — The effects of implementing this alternative would be similar to that of implementing the no-action alternative or alternative 2. The result would be an irretrievable loss of historic property throughout the valley. This loss would not eliminate whole districts but would result in the loss of elements in districts. Many of these structures would be adaptively reused, altering their function but preserving historic fabric. Many structures would continue to be used as originally designed and in districts that retain much of their character.

Conclusion — The effects on historic structures would be greater than under the no-action alternative and less than under alternative 2. Sugarpine and Ahwahnee Bridges would be removed and Curry orchard would be reduced in order to remedy natural resource-related problems. The result would be an irretrievable loss of historic property.

Cultural Landscapes

Yosemite Village. The landscape character would be managed to promote the visitor information facet that exists today. The effects of building removals and redesigns would be similar to alternative 2.

Ahwahnee Hotel. The effects under this alternative would be similar to alternative 2.

Curry Village. The landscape would have refinements to circulation, lodging, and services that are similar to alternative 2. In contrast to alternative 2, the old registration building would be restored, and the ice rink would be restored to its historic location. The effects of restoration and preservation actions would be positive. A small portion of the Curry orchard would be retained for cultural interpretation; this would have a negative effect on landscape character and would be an adverse effect, but it would provide some mitigation to the removal of the historic orchard.

Yosemite Valley. As in alternative 2, prominent landscape features such as meadows and the Merced River would be enhanced by moving or removing other landscape features, including roads, campgrounds, and bridges. This would result in the loss of significant character-defining landscape features to ensure the proper management of other character-defining (natural) landscape features.

Cumulative Effects — With changes over the years and the changes proposed in this alternative, each cultural landscape retains many significant character-defining features that remain relevant today, either as originally designed or as modified to meet modern needs. Cultural landscapes in Yosemite Valley would continue to be governed by design that is intended to be appropriate to place.

Conclusion — Effects on cultural landscapes would be greater than under the no-action alternative, since two bridges and a part of Curry orchard would be removed. These adverse effects would result in irretrievable losses of national register properties but less than under alternative 2.

Collections

Rehousing virtually all the collections at El Portal in a suitably designed, sized, and equipped facility would ensure proper care and preservation of collections, which would be an improvement over the no-action alternative.

IMPACTS ON VISITOR USE AND INTERPRETATION

As in alternative 2, the removal of automobiles from the valley would result in dramatic improvements to the visitor experience. It would also change the way people visit and prepare for visiting the park. For instance, the shuttle buses used for transportation in the valley would require people to carry a manageable amount of personal gear with them rather than simply packing a car. This could be perceived as an impact by those who enjoy spontaneity or the flexibility to use personal automobiles. The visitor experience would be improved because noise levels would be reduced, air pollution would be improved, and scenic vistas would be enhanced.

Visitor access to developments and features would be restricted as in alternative 2. Visitors with disabilities would experience the same inconveniences as those described for alternative 2. Some recreational experiences, such as auto touring, would no longer be available and some, such as hang gliding and photography, would require more effort.

The village would continue to be a primary destination for visitors and would continue to be the high density area of the valley. On the other hand, the Pohono orientation/transfer facility would ensure that visitors would not need to spend time searching for a place to park — access to the village and the opportunity to enjoy programs would be easier and immediate.

This alternative would significantly reduce visitor crowding and would remove the majority of traffic from the east end of the valley. It would profoundly impact the visitor experience. Similar to alternative 2, built intrusions at the east end of the valley would be reduced.

Access from the Pohono transfer center would be much the same as in alternative 2, except that the transfer center facility would take on all functions of the east end visitor center, creating a more central parkwide information and orientation center. The park would have no other parkwide orientation and major interpretive facility, so this center could provide much needed orientation and interpretation to a far greater number of visitors.

Construction activities in Yosemite Valley during VIP implementation could inconvenience park visitors and interfere with their overall experience. The level of disruption resulting from VIP implementation would depend in large part on how the construction process was managed. By scheduling construction material deliveries to avoid peak visitation periods, organizing traffic controls, and communicating access disruptions to visitors prior to arrival, the National Park Service should be able to minimize impacts on visitors during VIP implementation. Despite such planning, however, it is unlikely that potential adverse impacts on visitors could be fully mitigated.

Given the historically high demand for Yosemite visitation, it is anticipated that any displacement of park visitors due to the VIP-related construction would be replaced by visitation by those less concerned with construction effects. The displaced visitors would have the option of visiting during the winter and shoulder seasons when construction work would be minimal or stopped altogether. Consequently, implementation impacts on visitation are expected to be insignificant.

The visitor experience while VIP-related construction is in progress should not be greatly diminished. Most of the proposed construction should not create excessive noise or affect access greatly. For example, the proposed Pohono orientation/transfer facility is in an area far from where most visitation concentrates.

Visitors choosing not to visit Yosemite during the VIP construction period would not be permanently affected, since construction is only temporary (completed in five years). This would be particularly true under alternative 3, which would implement all changes in park facilities during the 5-year construction period. This construction schedule could be more disruptive to park visitation due to the larger scope and shorter duration than the 10-year construction schedule in alternative 1.

Information / Orientation

Information and orientation services would be much improved and would be more readily available to all visitors early in their visit. Backup information service and visit planning assistance would be available at the village transfer station. Campground users and lodging guests would have to travel to either the Pohono orientation/transfer facility or the village station for personal assistance with visit planning or information or to see the interpretive and orientation programs there. Wilderness users, however, would not have to travel farther than the Pohono orientation/transfer facility to obtain permits and information. The net result could be redundant travel on the connector shuttle.

Education / Interpretation

Interpretation would be considerably expanded and intensified in this alternative. The Pohono orientation/transfer facility would offer visitors an audiovisual program and a comprehensive and detailed introduction to the park's geology, natural history, and human use. This visit preparation would contribute to later interpretive experiences at the natural history and history museums and would increase interest and attendance at evening interpretive programs. Moreover, the development of the old visitor center into an education center would allow the

park to more effectively reach many young children and adults with educational programs that would increase understanding of the natural environment. The use of the structure as a program center would also increase understanding of environmental issues and the history of conservation and the National Park Service — themes not adequately addressed previously.

The development of a second museum (natural history), two new campground amphitheaters, improvements in the Indian Village of Ahwahnee, the cemetery, the old visitor center auditoriums, and the nature center at Happy Isles would provide the same benefits as alternative 2. Similarly, personal interpretive programs and outdoor trails and exhibits would be impacted in much the same way as in alternative 2, except that bicycle and hiking trails and associated exhibits would extend to the Pohono facility and the Pohono orientation/transfer facility would serve as a terminus for new interpretive walks, enhancing opportunities for resource understanding and enjoyment and adding new exhibit elements.

The relocation of the library, archive, and museum collections out of the valley would cause an adverse impact on visitors and some staff. Visitors would no longer be able to casually satisfy curiosity stimulated by interpretive programs by browsing in the library or archive. Amateur collectors and hobbyists would not be able to learn as easily from talking to staff specialists or looking through Yosemite's collections of natural history, ethnographic, and historical collections. The valley interpreters and other NPS personnel would no longer have easy access to collections and collections staff.

Recreation

Increased numbers of visitors on foot and bicycle could increase the potential for resource damage and visitor conflict, both requiring trail and site design mitigation and increased education, monitoring, and enforcement. The Pohono Quarry facility would allow easier bicycle and foot access in the west end of Yosemite Valley, especially in the Merced River corridor between the El Portal Road/Big Oak Flat Road junction and Valley View and extending to the east end of El Capitan Meadow.

While auto congestion and noise would be greatly reduced adjacent to roads, crowding at scenic areas and along popular bicycle and hiking trails could increase as visitors invest more time in these activities. Opportunities for quiet contemplation and the pursuit of such related activities as nature study, photography, painting, and writing could require more effort to find in some locations. Opportunities for viewing and appreciating archeological, historical, and cultural landscapes, and visiting museums would increase. Opportunities to participate in organized interpretive programs would also increase.

Many informal picnic sites along the river, especially between the El Portal Road/ Big Oak Flat Road junction and Pohono Bridge, would become unavailable as parking turnouts were eliminated and because hiking and biking trails do not extend to that area. Making picnic areas accessible only by shuttle, bicycle, or foot could make picnicking unavailable or more difficult to access for some visitors and change the experience for others.

Backpacks would have to be transported farther on shuttles to reach trailheads, which remain unchanged. Private autos would not be available for storage of food or equipment not needed on the wilderness trip. Instead of an undeveloped west valley, wilderness hikers along the Rockslides Trail, the top of El Capitan, and the Pohono Trail from Dewey Point to Discovery View would see views of the Pohono orientation/transfer facility.

There would be increased opportunities to hike in areas free of autos, buses, and shuttles. For day users, private autos would not be readily available for storing unneeded food or equipment. Increased hiking increases the likelihood of off-trail travel, which may be further increased by crowding on popular hiking and biking trails.

Fishing opportunities would be unaffected. There would be fishing along the river management zones where riparian and aquatic communities have been restored and riverine processes allowed to prevail. More people traveling on foot and by bicycle could mean more people accessing the river and stream margins.

Rock climbing opportunities would continue. Increased use of hiking or bicycle trails or placement of campgrounds close to climbing areas would allow increased and prolonged contact between climbers and nonclimbers. Access to climbs would be by foot, bicycle, or shuttle; climbing areas closer to developed areas could see increased use. Noise on climbs associated with autos, buses, and shuttles would be decreased. Climbers on Lower Cathedral Rock and the Leaning Tower and climbs in the Fifi Buttress, Widow's Tears, Wawona Tunnel, Discovery View, Last Resort Cliff, Audubon Buttress, Nuts Only Cliff, and Little Wing areas would look down on the Pohono facility.

Transport of hang gliders and other large recreational equipment would be a challenge.

Skis and ice skates would be available to rent at Curry Village at the new ice rink pavilion.

Cumulative Effects — A major trip planning/orientation center would be a part of the transfer facility, with more potential benefits to visitors than alternative 2. As in alternative 2, other interpretive services would be more central and integral to movements about the valley, since they would be linked to the in-valley transportation network. A reduction in the number of automobiles in Yosemite Valley would greatly improve the quality of the visitor experience and recreational environment. The visitor experience would be more dominated by the valley and available opportunities than by the frustration of dealing with traffic and finding a parking space. Some resource protection measures would reduce visitor freedom and discretion.

Conclusion — Interpretive services would be improved compared to the no-action alternative. Recreational pursuits would be available in a more tranquil and safe environment. Activity would increase in the west end of the valley where expanded hiking and bicycling opportunities would be available. Most auto touring would be replaced by recreational activities more directly involved with the resource or by guided tours. The camping experience would be less crowded and more comfortable, but there would be fewer campers.

IMPACTS ON SOCIOECONOMIC CONDITIONS

Many of the changes to park facilities, roads, and landscapes proposed under alternative 3 would be implemented in addition to those under the no-action alternative. The National Park Service expects that the additional construction and related work would cost approximately $204.9 million in 1997 dollars, or $40.9 million per year over five years (over the cost of the no-action alternative). Of these expenditures, $172.1 million would be earmarked for construction and project administration and would directly impact the region's economy. It is estimated that this spending would create 710 FTE jobs. This employment would be generated both directly from onsite construction activities and indirectly from the economic expansion induced by project labor and nonlabor spending in the region.

Based on recent employment estimates, the creation of 710 new jobs would result in about a 2.9% drop in total unemployment in the affected region and would lower the unemployment rate by almost 0.4%. Total project-associated personal income to be realized by area residents is estimated to be nearly $105 million, or approximately $21.0 million per year over the 5-year construction period.

As the employment impacts of this alternative are only marginally different than those anticipated under alternative 2, the magnitude of population and related socioeconomic impacts should be similar and no greater than 0.4%.

The VIP alternatives propose to restore major areas of the valley for nonrecreational use and to alter facilities and operations in the valley. Significant changes in the park's facilities, layout, and operations are proposed.

The proposed improvements and environmental restoration efforts associated with alternative 3 could encourage visitor demand for Yosemite visitation by improving the visitor experience.

No quantifiable projections of future visitation at the park solely associated with the VIP alternatives could be identified. From an analysis of the numerous other factors associated with future Yosemite visitation, it is concluded that other factors could have a significant and uncertain impact on future visitation. It is not possible to clearly isolate and predict the impacts solely associated with the proposed VIP alternatives on future visitation.

Some specific differences among the socioeconomic impacts of the alternatives can be identified and estimated. Significant differences exist in the campsite capacity proposed under the VIP alternatives. The differences between the VIP alternatives in their proposed camping capacity represents a significant potential impact on park visitation and on the regional economy.

The 81 sites fewer campsites proposed under alternative 3 would represent a significant decrease in the park's lodging capacity. The impacts include reductions in park overnight visitation from lost overnight campers and regional impacts of lost visitor spending associated with the excluded campers. These impacts would be somewhat offset by the greater construction expenditures associated with the reconfiguration of all valley camping proposed under alternative 3 and reduced construction-related impacts on the regional economy.

There has been high visitor demand for in park lodging (particularly in the valley). Throughout the majority of the camping season, campgrounds generally operate near capacity. The total number of campsites under alternative 3 would be significantly less than the pre-flood capacity, and so considerable unmet demand for in-park camping could be anticipated. It is expected that the 81 campsites removed under alternative 3 would have operated at or near capacity during the operating season.

Based on a seasonal campground occupancy rate of 95% and an operating season from mid-April to mid-October (approximately 180 days), the total overnight campsite rentals from the campsites lost under alternative 3 would be approximately 13,851 (81 × 180 × 95%).

According to the Gramann survey, the average group size for summer auto visitors to Yosemite is 3.8. Since the majority of the valley's campground visitation occurs during the summer and most campers visit the park by car, this figure has been used to represent the average group size for campers in the park. The total number of person nights that would be displaced under alternative 3 would be approximately 52,634 (13,851 × 3.8). The average per capita daily spending for all overnight in-park visitors is estimated to be $57.52. This average daily spending figure was adjusted downward to reflect lower per capita daily spending on food and lodging by campers when compared to hotel visitors. The average daily per capita spending by in-park campers is estimated to be approximately $33. Using this figure, the displaced overnight visitation by campers would represent lost annual visitor spending of approximately $1.74 million (52,634 × $33).

Under alternative 3, in addition to the new campsite construction (to replace campsites destroyed by the 1997 flood), all the campgrounds in the valley would be reconfigured and improved. The total cost for the campground construction under alternative 3 is estimated to be approximately $17.7 million dollars more than the campground construction costs for alternative 1. The additional construction spending would provide 73 FTE jobs and approximately $10.8 million in additional income to the region.

If there is sufficient excess lodging capacity in the region to accommodate the excluded

campers, then local campgrounds or hotels would capture the lost park camper spending. If the excluded park overnighter spending is captured in this manner, there would be little net loss in spending in the region and a limited net impact to the regional economy. Visitor spending would transfer from inside the park to the surrounding communities. Although the camping experience of visitors displaced from the valley campgrounds could be somewhat reduced, the past strong demand for overnight visitation suggests that most of the excluded campers would readily accept local accommodations as a substitute camping experience.

Regional campgrounds and hotels generally experience very high occupancy rates during the peak season. It is unlikely that they would have enough excess capacity to absorb the unmet demand from lost valley camping caused by the 1997 flood. At least in the short term, it is expected that some visitor spending would be lost from the regional economy.

Over the longer term, lost spending impacts could be recovered by the addition of camping or lodging capacity in the region. In the past, the region's lodging capacity has increased to accommodate unmet overnight lodging demand from Yosemite visitors. Further increases in the region's lodging capacity would probably meet any additional demand in local overnight visitation associated with reductions in the park lodging capacity or increased demand for local overnight visitation. Local campground operators might have sufficient lead time to expand their operations or open new facilities to accommodate campers who would be excluded. In that case, there would be negligible lost visitor spending and construction-related economic impacts since these economic impacts would transfer from inside the park to elsewhere in the local region.

Conclusion. In the short term, the reduction of in-park camping by 81 campsites could result in a net decrease in visitor spending of $1.74 million annually in the affected region. However, over the long term, it is expected that no significant visitor spending would be lost since additional lodging capacity in the region would be expected to develop to recapture unmet overnight visitor demand.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The removal of historic structures and character-defining elements of the landscape would result in an irretrievable loss of these resources. Any loss of archeological sites would also be irretrievable.

Documentation and data recovery efforts would provide mitigation. The level of documentation would be established through consultation with the California state historic preservation officer as part of the 106 compliance described in *General Management Plan* and the *Concession Services Plan.*

IMPACTS ON THE NATURAL ENVIRONMENT

Vegetation

Aquatic/Riparian, and Meadow Communities. A total of 17 acres of aquatic, riparian, and meadow communities would be restored, in this alternative, including the establishment of the Merced River management zone, the modification of the Ahwahnee and Sugarpine Bridges, and small patches along the Merced River. The restoration of the Rivers Campground and portions of Lower Pines and Camp Six would be similar to alternatives 2 and 3. Small amounts of riparian restoration could increase the integrity of the river channel and slightly increase the quality of key habitat. Four acres would be redesigned and 5 would be developed.

Impacts on the Taft Toe and Pohono areas would be the same as in alternative 1.

Upland Communities. Ninety-five acres would be restored, 66 redesigned and 26 developed for a net gain of 69 acres. Most of the restoration and redesign would take place in mixed conifer. Restoration of 88 acres of degraded mixed-conifer forest is proposed in this alternative. Much of this restored acreage is now forest, but it would change to meadow and riparian communities based on projected water table levels and historic vegetation communities.

Redesign in the mixed conifer forest would total 62 acres, primarily at concession housing in Curry Village and in the Ahwahnee parking lot. There would be no new development in mixed conifer communities. There would be a net gain of 26 mixed conifer acres.

The need for hazard tree removal would be reduced in restored areas but would increase around new development. Human/wildlife interactions are not expected to change significantly but would be reduced at Curry orchard by replacing the apple trees with a nonfruiting variety.

Impacts on the California black oak community would be similar to alternative 1.

Reestablishment of oak woodlands would be considered on a site-by-site basis. Impacts on the live oak community would remain generally the same as alternative 1.

Entrance information centers would impact the natural environment by removing developing acreage.

Cumulative Effects — The cumulative impacts on plant communities under this alternative would be similar to the no-action alternative.

Conclusion — A total of 95 acres would be restored. A total of 26 acres of upland communities would be developed.

Wildlife

Lamon orchard would be developed with replacement campsites similar to alternatives 2 and 3. The Curry Village orchard would still be used as a parking lot, but replanting with a nonfruiting variety of apple tree would reduce impacts on wildlife and human safety.

Cumulative Effects — Many of the historical impacts created by development in east Yosemite Valley would continue due to habitat fragmentation and degradation. Human/wildlife conflicts would continue at current high levels.

Conclusion — Alternative 4 would provide little benefit to wildlife due to limited habitat restoration. There would be no added impacts on wildlife and habitat in west Yosemite Valley.

TABLE 42: RIVER VALUES

Outstandingly Remarkable Values	Impacts
Scenic	Views of waterfalls, rock cliffs, black oak woodlands, and historic scenes would be enhanced by the removal of development in the 100-year floodplain.
Geological	No impact would occur.
Air Quality	Hydrocarbons, carbon monoxide, and oxides of nitrogen would decrease slightly as a result of reduction of private vehicles.
Recreational	Hiking, picnicking, camping, fishing, photography, swimming, nature study, horseback riding, biking, and sightseeing would all be enhanced by removing structures in the river corridor.
Biological	Biotic communities, particularly riparian areas and their habitats, would be enhanced by removing development in the river corridor. Neotropical migrant songbirds and some rare bat species would benefit.
Cultural	Modification of two bridges would impact the cultural scene in the river corridor.
Hydrological	The natural flood regime and hydrologic processes of the Merced River would benefit little from modifying two bridges in the river corridor.

Merced River Scenic and Recreational Values

In this alternative 78 acres of development in the wild and scenic river corridor would be restored; 56 other acres would also be restored. No new development would occur in the river corridor. Scenic, recreational, air quality, biotic, and hydrologic processes would be improved.

Cumulative Effects — Development impacts would be reduced along the Merced River. Valleywide effects on the river would be greatly reduced compared to the no-action alternative, but there would be less benefit to the river than under alternatives 2 and 3.

Conclusion — The amount of riparian area that is affected by visitor impacts and development would be reduced substantially through the restoration of 78 acres in the river corridor.

Water Resources

Hydrology. The Sugarpine and Ahwahnee Bridges, which constrict the Merced River and force high water into an overflow channel, would be modified. The modification would provide little benefit to natural hydrologic processes. The overflow channel near Sugarpine Bridge could become the main channel.

Alternative 4 would improve existing conditions but to a lesser extent than alternatives 2 or 3.

Water Quality. Impacts would be the same as in alternative 1.

Cumulative Effects — Effects on hydrology and fluvial processes, which are crucial in sustaining the ecosystem dynamics in Yosemite Valley, would be reduced compared to the no-action alternative, but only in the most sensitive or heavily damaged sites. The development and human activities that have negatively influenced the condition and distribution of high value aquatic, riparian, and meadow communities would be directed to more resilient sites.

Conclusion — Effects of development and human activity on water resources would be reduced slightly through modification of two bridges and greatly through relocation of the most damaging campsites and structures.

Air Quality

Visitors would be allowed to drive into the east end of Yosemite Valley, but driving restrictions would be adopted. Visitors would use the park shuttle bus system to move about the valley. This would reduce pollutant emissions more than the no-action alternative, but there would be more of other pollutants except NO_x than in alternatives 2 and 3. NO_x emissions, though similar at the onset, would be less than in alternatives 2 and 3 by 2015.

TABLE 43: EMISSIONS SUMMARY, DRIVING RESTRICTIONS FOR THE EAST END OF YOSEMITE VALLEY

Pollutant (tons / year)	Year 1995	Change from no action	Year 2015	Change from no action
VOC	184.0	(-8%)	89	(-1%)
CO	1,538.0	(-9%)	245	(-6%)
NO_x	192.0	(-3%)	71	(-3%)
PM	3.8	(0%)	2.5	(0%)
SO_2	8.3	(0%)	6.9	(0%)

Source: EA Engineering 1996.

Cumulative Effects — The greatest influences on air quality in the Yosemite region would continue to be from sources outside of the park and adjoining counties. A transit system in the valley would reduce emissions, meaning a reduction in pollutants in the region. The elimination of parking at many popular attractions (such as Lower Yosemite Falls) and the resulting reduction in exhaust fumes would improve the quality of the visitor experience in those locations. Campfires would continue to have significant direct and localized effects on air quality.

Conclusion — The reduction in automobile use and the complete reliance on transit buses for movement about the valley would result in a reduction in vehicle emissions. The visitor experience would be improved at major attractions, but effects would be greater than under alternatives 2 and 3.

Scenic Quality

From Glacier Point 104 acres of previous development would be restored in the viewshed. Scenic views from Glacier Point would remain affected by retaining the Camp Six area for parking. None of the scenic viewpoints would be significantly changed under this alternative. There would be minimal improvement to the scenic quality of the valley.

Noise

Noise impacts would be less than under the no-action alternative, but greater than under alternatives 2 and 3. On a peak day, approximately 3,086 day visitor vehicles, 918 overnight visitor vehicles, and 44 motorcoaches would enter and leave on Southside Drive. The number of vehicles passing any point in the valley would be less than in the no-action alternative, because visitors would park their vehicles at overnight accommodations or day use parking areas for the duration of their stay.

IMPACTS ON CULTURAL RESOURCES

Archeological Sites

Up to eight archeological sites would be directly affected by actions similar to those described for alternative 2. Actions at six of these sites would differ from the treatment proposed by the *General Management Plan*. Mitigation would be similar to that described for alternative 2.

The eight sites in the affected area are classified by site type and potential to yield important information: 1 large village, 1 small village, no house sites, 2 large camps, and 4 historic. Sites with the potential to yield important information include 1 exceptional, 2 high, 4 moderate, and 0

low. Impacts, which are mostly ground disturbance, depend on the type of actions proposed and could be adverse. These would be mitigated by data recovery.

Several areas that are likely to contain undocumented or buried historic era archeological remains would be affected by ground disturbing activities. Effects would be avoided through the normal process of site testing. Effects of the alternative on these resources would be managed as described for alternative 2.

Environmental restoration would occur at three sites. Effects of ground disturbing activities from restoration would be similar to alternative 2.

Cumulative Effects — As in alternatives 2 and 3, total cumulative impacts on archeological sites would be less than under the no-action alternative. Disturbing these sites could result in moderate to significant loss of archeological information, which could be partly mitigated through careful planning and data recovery.

Conclusion — Up to 8 sites would be directly affected under this alternative. Long-term preservation would be enhanced at three sites. This alternative involves the least impacts on sites of all the alternatives.

American Indian Traditional Cultural Properties

Effects would be similar to alternative 2.

Historic Sites, Structures, and Buildings

Ahwahnee Hotel. Same as alternative 2.

Camp Curry Historic District. Impacts would be the same as alternative 2. Replanting the orchard with nonfruiting apple trees would be an impact, but it would allow the orchard to be retained as part of the historic scene while eliminating the apples as a wildlife attractant.

Yosemite Valley Bridges. The Ahwahnee and Sugarpine Bridges would be modified, which would require appropriate mitigation, including documentation. The effects would influence the historic design and would probably be adverse. Stoneman Bridge would be retained to maintain more vehicle capacity than in alternatives 2 and 3, which would preserve the historic structure.

Cumulative Effects — The effects of implementing this alternative would be similar to that of implementing the no-action alternative. The result would be an irretrievable loss of historic property throughout the valley. This loss would not eliminate whole districts but would result in the loss of elements in districts. Many structures would be adaptively reused, altering their function but preserving historic fabric. Many structures would continue to be used as originally designed and in districts that retain much of their character.

Conclusion — The effects on historic structures would be greater than under the no-action alternative. Effects on Curry orchard would be less than under alternative 2 but would ensure that an orchard was part of the Curry Village scene. Modifying the historic bridges would retain them in the historic scene, but effects would be adverse. Hydrologic issues would remain.

Cultural Landscapes

Yosemite Village. As in alternative 2, most functions inside the boundaries of the cultural landscape would be retained, including visitor services, information, and residential, but administrative functions would be moved. This would not dramatically change the character of the landscape. The effects of building removals and redesigns would be similar to those in alternative 2.

Ahwahnee Hotel. The effects under this alternative would be similar to those in alternative 2.

Curry Village. The landscape would have refinements to circulation, lodging, and services. Replanting Curry orchard with nonfruiting, non-

historic varieties of apple trees would be both and impact and mitigation. Although the variety would be modern, the orchard would continue to be a character-defining feature of the landscape.

Yosemite Valley. Restoration of prominent landscape features such as meadows and the Merced River would be minimal, and removal of other landscape features, including roads and campgrounds, would be limited. Modification of the Ahwahnee and Sugarpine Bridges would be an adverse effect.

Cumulative Effects — Cumulative impacts would be similar to the other alternatives.

Conclusion — Effects on cultural landscapes would be greater than under the no-action alternative and similar to but less than under alternative 2. Two bridges would be modified and Curry orchard would be retained but altered. As in the other alternatives, adverse effects would result in irretrievable losses of national register properties.

Collections

The library would remain on the second floor of the history museum along with the slide archive. The removal of offices would provide better space for the resources and work space for visitors and staff. Environmental controls for the library and archives would be needed, and their addition might adversely impact the historic structure. Archival materials would be installed on the second floor of the natural history museum, where they would benefit from the additional space.

The museum collections would be dispersed among existing buildings in the valley (yet to be determined); less frequently used and oversized objects would be stored in a facility at El Portal. There would be risks and diminished control while objects were in transit; rigorous location and movement recordkeeping would be necessary. This represents a potential adverse effect on irreplaceable collections.

Conclusion — Effects would be similar to the no-action alternative.

IMPACTS ON VISITOR USE AND INTERPRETATION

The quality of the visitor experience would be improved because the general quality of the valley environment would be improved. Better traffic flow and diminished congestion would result in a more tranquil atmosphere. Facility upgrades would contribute to a better experience. Some traffic and congestion would continue because day use visitors would search for open parking spaces in the three day use parking areas in the east end of the valley.

Information and Orientation

Information and orientation at the entrances would supply information and initial wayfinding assistance. This should reduce confusion and redundant trips. Parking changes would reduce wasted time and travel searching for spaces. There would be fewer visitors entering the area as a result of the reduction in campsites and lodging accommodations.

The valley visitor center would be remodeled to accommodate a more efficient information facility. This would result in significant changes to the building and dramatically improve the quality of information services. Another information center at the Village Store would reduce crowding at the visitor center and speed up service to visitors. Similar benefits would result if concession support were obtained for the installation of information centers near registration areas at lodges.

Interpretation

New and renovated exhibits at the valley visitor center would improve the visitor experience. A new and separate bookstore would enhance the enjoyment of browsing since it would be protected from the sometimes too busy and confusing atmosphere of the information area.

Personal interpretive programs (walks, evening programs) would remain at existing levels in locations with traffic noise. The valley tram tour could be in greater demand due to the reduced availability of parking and turnouts for private vehicles. Outdoor exhibits and trails would remain unchanged, with enhancement primarily as replacements or upgrades became necessary. The nature center at Happy Isles would be available seasonally. Interpretation would be enhanced in the small facility along the approach to Yosemite Falls, where some of the park's most compelling stories could be told by interpreters.

The library, archive, and museum collections would be on the second floors of the buildings where history and natural history would be interpreted. Visitors could satisfy curiosity raised at presentations.

Recreation

Removing many parking spaces and turnouts would cause congestion and make auto touring less appealing. Most other forms of passive recreation would continue to be impacted by traffic, although at less than current levels. Camping and picnicking would continue to be enjoyed as they are, but fewer campsites would be available, particularly along the river. Dining would be unaffected.

Bicyclists would continue to have conflicts with motor vehicles on Northside and Southside Drives. Other active recreationists could be impacted by a reduction in parking spaces near recreational sites and by the need to carry gear on the shuttle buses when accessing these sites.

Cumulative Effects — Interpretive services would not be linked to the transportation network, as in alternatives 2 and 3, and therefore would not be available to all visitors. There would be more automobiles in the Yosemite Valley than in alternatives 2 and 3, which would continue to degrade the visitor experience.

Conclusion — Interpretive services and the recreational setting would be improved more than in the no-action alternative but would not improve as much as in alternatives 2 and 3.

IMPACTS ON SOCIOECONOMIC CONDITIONS

All the physical changes to the park stipulated under alternative 4 either have already been proposed in earlier planning studies or are necessitated by the damage from recent flooding. Fewer campgrounds would be constructed (although at a higher cost since work would include reconfiguration and relocation of sites).

The National Park Service expects that the construction and project administration work for alternative 4 would cost approximately $25.5 million (in 1997 dollars) more than alternative 1 (or about $2.6 million per year over 10 years). During the 10-year implementation period spending on alternative 4 would create about 105 more FTE jobs locally than alternative 1.

Based on recent employment estimates, implementing alternative 4 would result in an approximate 0.5% drop in unemployment and less than 0.1% decline in the unemployment rates in the affected region compared to alternative 1. Total construction-associated personal income realized by area residents would be nearly $15.5 million more than under alternative 1 (or $1.6 million per year over the 10-year construction period). Insignificant population or subsequent housing and tax impacts would be expected.

VIP development would include reconfiguration of the remaining campgrounds. As a result of the environmental restoration and reconfiguration of the park layout and operations, it is estimated that 662 campsites would be left in the valley. This would be a reduction of 94 campsites.

The 94 fewer campsites would represent a significant decrease in the park's lodging capacity. The impacts include reductions in overnight visitation and regional impacts from lost visitor spending associated with the excluded campers. These impacts would be somewhat offset by the greater construction expenditures associated with reconfiguring all valley camping and re-

duced construction-related impacts on the regional economy.

Considerable unmet demand for in-park camping can be anticipated if the camping capacity in the valley is reduced. All campsites would operate at or near full capacity during the season. Based on a seasonal campground occupancy rate of 95% and an operating season from mid-April to mid-October (comprising approximately 180 days), the expected total overnight campsite rentals from the campsites lost would be approximately 16,070 (94 × 180 × 0.95). The number of person-nights that would be displaced would be 61,070 (16,070 × 3.8). Assuming the average daily per capita spending by in-park campers is approximately $33, the displaced overnight visitation would represent lost annual spending of approximately $2.02 million (61,070 × $33).

In addition to the construction to replace campsites destroyed by the 1997 flood, all the campgrounds in the valley would be reconfigured and improved. The total cost for the campground construction would be approximately $22.3 million, which would be $15.5 million more than the campground construction costs in alternative 1. The additional construction spending would provide 32 FTE jobs and approximately $9.4 million in additional income to the region over a 10-year period.

If there is enough excess lodging capacity in the region to accommodate the excluded campers, then local campgrounds or hotels would be expected to capture the lost camper spending. If the excluded park overnighter spending is captured in this manner, there would be little net lost spending in the region and a limited net impact to the regional economy. Visitor spending would transfer from inside the park to the surrounding communities. Although the experience of displaced visitors would be somewhat reduced, the past strong demand for overnight visitation suggests that most of the excluded campers would readily accept local accommodations as an acceptable substitute.

Regional campgrounds and hotels have very high occupancy rates during the peak season. It is unlikely that they would have enough excess capacity to absorb the unmet demand from lost valley camping caused by the 1997 flood and would not be able to accommodate the additional displacement of campers. Some visitor spending could be lost from the regional economy.

Over the longer term, lost spending could be recovered by the addition of camping and lodging in the region. In the past the region's lodging capacity has increased to accommodate unmet overnight lodging demand from Yosemite visitors. It is expected that further increases in the region's lodging capacity would meet any additional demand in local overnight visitation. The planning and construction time necessary for the *Draft Valley Implementation Plan* and reconstruction of the campsites destroyed by the 1997 flood could allow campground operators sufficient lead time to expand their operations or open new facilities to accommodate campers. In that case, there would be negligible lost visitor spending and lost construction-related spending since these economic impacts would transfer from inside the park to the local region.

Conclusion — In the short term, the reduction of in-park camping by 94 campsites could result in a net decrease in visitor spending of $2.02 million annually in the affected region. Over the long term, it is expected that no significant visitor spending would be lost since additional lodging capacity in the region should develop to recapture unmet overnight visitor demand.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Removing historic structures and character-defining elements of the landscape would result in an irretrievable loss of these resources. Any loss of archeological sites would also be irretrievable. Documentation and data recovery efforts would provide mitigation. The level of documentation would be established through consultation with the California state historic preservation office.



CONSULTATION AND COORDINATION

During the preparation of the *Draft Valley Implementation Plan*, input was actively solicited from a broad range of public constituencies as part of an ongoing public involvement process. These included academia, business interests, concessioners, the congressional delegation, county and local governments, environmental groups, the general public, American Indian groups, news media, recreation and tour industries, and park staff.

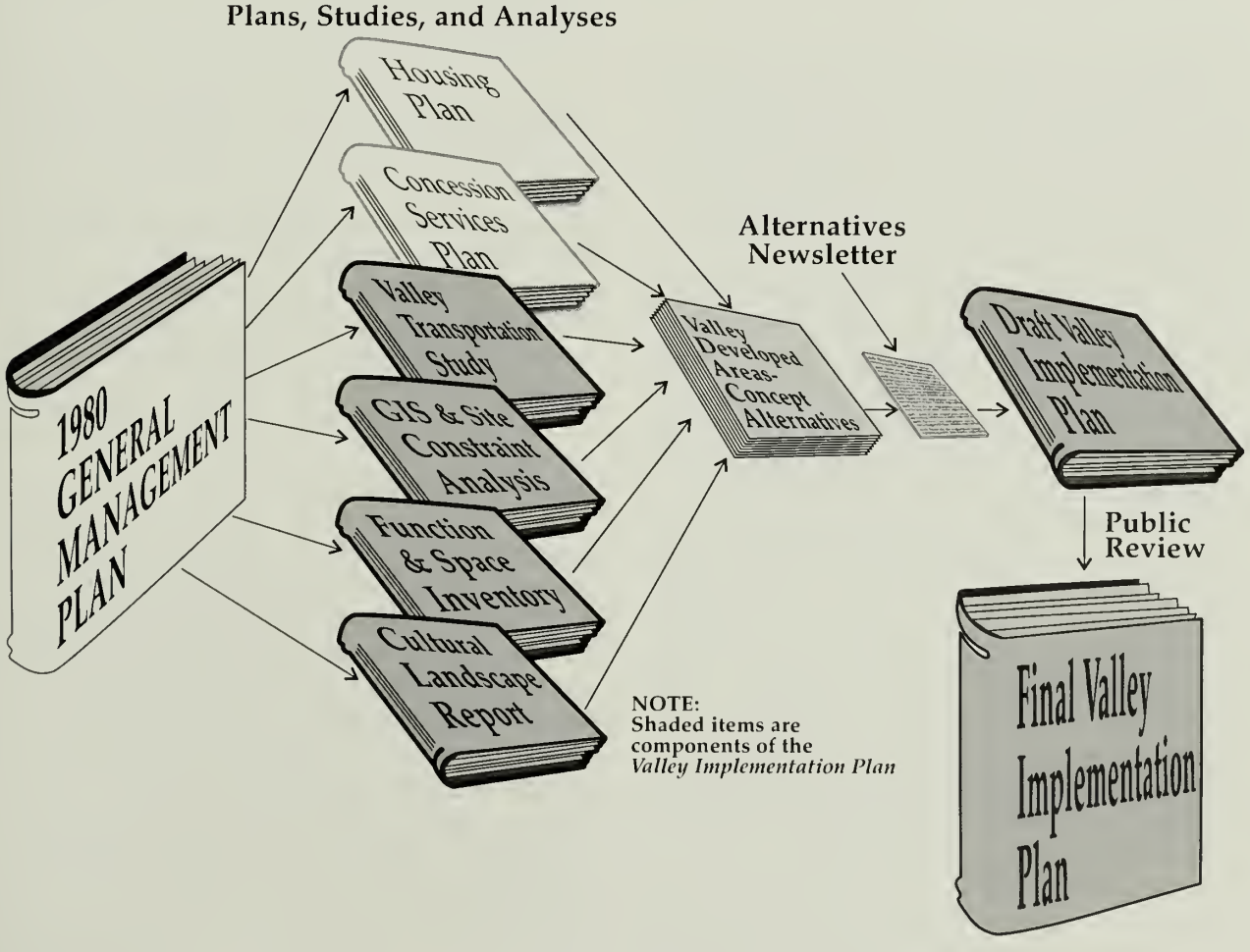
This chapter summarizes public involvement activities during the EIS preparation process.

SCOPING

Scoping is the process of determining significant issues and concerns by soliciting input from groups and individuals. It is also used to identify criteria and alternatives for analysis.

Formal public scoping for the *Draft Valley Implementation Plan* was initiated by the National Park Service through a notice of intent, published in the *Federal Register* on December 14, 1993. The scoping period ran for 60 days.

PROJECT FLOW CHART



During public scoping, 149 comment letters were received from individuals, organizations, and government representatives. The letters are on file in the offices of the Resource Management Division, Yosemite National Park.

Each comment letter was analyzed to understand the issues, concerns, and suggestions that were expressed. Comments were summarized in the categories of transportation, employee housing, natural resource management and restoration, cultural resource management, visitor use management, and visitor services. A total of 83 distinct issues or concerns were raised during scoping. The following is a brief summary of these public comments.

ISSUES IDENTIFIED

Transportation

Many individuals expressed concern over continuing lack of resolution of the traffic congestion issues. Most wanted to see the automobile removed from Yosemite Valley. Many individuals expressed concern or questions about the placement of staging areas. Many respondents also asked that the National Park Service not consider placing a parking garage in the valley. Some asked that consideration be given to alternatives that would place parking and shuttle services at the three west entrances. Others asked that railroad and light rail be considered as alternatives. The need for a regional approach to planning was raised as an issue. Many traffic management measures were recommended.

Employee Housing

Many commenters asked that nonessential employees be housed outside of Yosemite Valley; many others voiced the concern that moving housing from the valley to another part of park, such as Wawona, would just be relocating the impacts and problems.

Natural Resource Management and Restoration

Restoration of recovered lands was a common goal for many of those who commented. There was also a desire to reduce air and water pollution in the valley.

Cultural Resource Management

Concerns were voiced over the condition of historic buildings and trails. The need to provide space for American Indians to practice traditional cultural activities was raised as an issue.

Visitor Use Management

Day use limits and reservation systems were recommended by many respondents as an means of reducing visitation pressures.

Visitor Services

Improved interpretive services were requested by many. Some individuals requested that numbers of campsites be either decreased or increased. Condition, proximity, and type (walk-in or drive-in) of camping areas were raised as issues. Access for climbers and river rafters was raised as an issue.

American Indian Interests

These groups emphasized their relationship to Yosemite and their traditional practices and ancestral uses. The need to have access to the park for these traditional activities without fees was expressed. They also want to retain the sanctity of burial areas and archeological sites. Most groups would like to be able to gather materials of traditional value. They are concerned about the number of people and vehicles in Yosemite Valley. They also believe that park employees could live in outside communities.

County Governments and Business Interests

In these contacts, representatives emphasized the desire to work with the National Park Service in dealing with transportation issues and developing a regional transportation system. Concern was expressed about the effects of the *Restricted Access Plan* on the economies of gateway communities and the uncertainty it causes for the visitor.

Environmental Groups

Issues raised in meetings with these groups were similar to those raised during public scoping. Issues of major concern were related to transportation, employee housing, and the amount of infrastructure in the valley. Restoration was a major interest as were visitor use levels and visitor services.

PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Written Public Comments

A *Federal Register* notice and media announcements initiate the beginning of a formal public comment period on this draft plan. All interested agencies, groups and individuals are invited to review the document and submit comments.

Open House Sessions

During the comment period but prior to public meetings, the National Park Service will host four open house informational sessions. These open house sessions will provide the public with an informal opportunity to learn about the plan, the alternatives, the major issues, and the results of the impact analyses. Open houses will be held in Merced, Los Angeles, San Francisco, and Yosemite Village. The time, date, and location of each open house will be announced in the *Federal Register*, in a planning newsletter, and in local news media.

Public Meetings

Public meetings on the draft plan will be held in Merced, Los Angeles, San Francisco and Yosemite Village during the latter part of the public comment period. The date, time and location of each meeting will be announced in the *Federal Register*, in a planning newsletter, and in the local news media.

DEVELOPMENT OF THE PROPOSAL AND PREPARATION OF THE DRAFT DOCUMENT

December 14, 1993: Notice of intent to prepare a (supplemental) environmental impact statement to the *Yosemite National Park Final General Management Plan and Environmental Impact Statement* was printed in the *Federal Register*. The public scoping period began.

December 14, 1993: A news release was distributed to individuals and organizations on the park's media and planning and compliance mailing lists to seek input to guide the VIP planning effort.

June 19, 1995: *Alternative Transportation Modes Feasibility Study, Yosemite National Park*, was released to the public by the U.S. Department of Transportation. A public meeting was held in San Francisco to brief the news media and environmental groups on the transportation study and its recommendations.

June 19, 1995: A public meeting was held in Merced to brief the Mariposa, Merced, Madera, and Tuolumne County boards of supervisors, the news media, business interests, and environmental groups on the transportation study.

June 20, 1995: A public meeting was held in Yosemite Valley to brief NPS and concession employees on the transportation study.

July 24, 1995: Meeting with North Fork Mono tribal board of directors in Bass Lake, California. NPS representatives met with the

tribal council to discuss issues and concerns. Six tribal members were present.

July 26, 1995: Meeting with Mono Lake Paiute tribal chairman and members in Lee Vining, California. NPS representatives met with the tribal council to discuss issues and concerns. Five tribal members were present.

July 27, 1995: Meeting with American Indian Council of Mariposa County and representative of the Tuolumne County Band of Mewuk in Mariposa, California. NPS representatives met with the tribal council to discuss issues and concerns. Fifteen tribal members were present.

December 15, 1995: Meeting with environmental groups, Oakland, California. The National Park Service met to discuss issues and concerns and to present information on the preliminary range of alternatives. Representatives of National Parks and Conservation Association, Sierra Club Yosemite Committee, and Yosemite Restoration Trust and Wilderness Society were in attendance. Six organization representatives were present.

January 10, 1996: *Newsletter 1—Planning Update, Yosemite National Park*, Volume 1, Fall 1995, was made available through a mailing to the VIP mailing list. The newsletter provided a status of planning projects and GMP accomplishments and outlined the planning process for the public.

January 29, 1996: Yosemite Area Regional Transportation Strategy meeting in Bass Lake, California. The National Park Service presented information on the plan to the technical review committee and management board. The purpose of the briefing was to solicit information about issues affecting the transportation planning effort and to discuss preliminary work on alternatives.

February 6, 1996: Briefing at the Mariposa County board of supervisors meeting, Mariposa, California. Presentation before the board of supervisors to discuss issues and preliminary work on alternatives.

March 12, 1996: Meeting with Mariposa County supervisors and planning staff, Yosemite National Park. NPS staff presented detailed information on the preliminary alternatives for a combined meeting of the supervisors and their planning staff; local business people and the news media were also present. Issues and concerns were discussed.

March 19, 1996: Briefing at the Madera County board of supervisors meeting, Madera, California. Presentation before the board of supervisors to discuss issues and preliminary work on alternatives.

March 28, 1996: A meeting was held between the National Park Service and members of YARTS to discuss issues and the scopes of YARTS and the *Valley Implementation Plan.*

March 29, 1996: Meeting with representatives of the Sierra Club committee on Yosemite, in Yosemite National Park to discuss planning matters, including the VIP alternatives and issues. Three representatives were present.

March 30, 1996. Yosemite Association spring forum. The National Park Service presented information on VIP issues and preliminary alternatives and accepted comments from members, guests, and media.

April 8 to 11, 1996: Yosemite Transportation Symposium in Fresno, California. The symposium was focused on transportation technologies. A panel of nationally recognized experts met in a round table forum that included regional planning partners, business interests, the environmental community, and academia.

July 16, 1996. Briefing at the Mono County board of supervisors meeting, Bridgeport, California. A presentation was made before the board of supervisors on the issues and preliminary work on alternatives.

July through September, 1996. An article on the VIP goals, major issues, and alternatives was made available to the visiting public through an article in the *Yosemite Guide*, which is

distributed at entrance stations with each entry permit.

August 15, 1996. Meeting with a representative from the California Office of Historic Preservation to discuss the range of options being considered and to consider alternative approaches to completing NHPA section 106 compliance.

August 20, 1996. Meeting with Mariposa County planning staff and one county supervisor to provide update information on the status and specifics of the *Draft Valley Implementation Plan.*

September 18, 1996. Meeting with the American Indian Council of Mariposa County to provide updated information on status and specifics on the plan. Six AICMC representatives were present.

October 8, 1996. Briefing to the Inyo County board of supervisors meeting in Independence, California. Presentation before the board of supervisors to discuss issues and preliminary work on alternatives.

October 9, 1996. Briefing in Lee Vining to one of the community committees of the Mono County planning department. The purpose of the plan, its alternatives, and related issues were discussed.

February 20 and 27, and March 8, 1997. Presentation to Sierra Club chapters in Merced and Palo Alto, and California and Nevada conservation directors at a meeting near Morro Bay. Presentations on flood effects, the role of the *Draft Valley Implementation Plan* in flood recovery efforts, VIP alternatives, and major issues were made.

March 4, 1997. Presentation to Rock Rendezvous, Cragmont Climbing Club, and representatives of the Access Fund (rock climbing organizations) at a meeting in Berkeley, California. Presentations on flood effects, the planned role of the *Draft Valley Implementation Plan* in flood recovery efforts, VIP alternatives and major issues were made.

LIST OF AGENCIES AND ORGANIZATIONS TO WHOM THE *DRAFT GENERAL MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT* IS BEING SENT

Federal Agencies

Advisory Council of Historic Preservation
Department of Agriculture, U.S. Forest Service
- Boise Interagency Fire Center
- Inyo National Forest
- Missoula Fire Science Lab
- Pacific Southwest Forest and Range Experiment Station
- Sierra National Forest
- Stanislaus National Forest
- Toiyabe National Forest

Department of Defense, Army Corps of Engineers
Department of Health and Human Services, Public Health Service
Department of the Interior
- Bureau of Land Management, Folsum, California Office
- Bureau of Reclamation, Sacramento Office
- Geological Survey, Menlo Park, California Office
- Fish and Wildlife Service, Sacramento Regional Office

Department of Transportation, Federal Highway Administration, Sacramento
Environmental Protection Agency, San Francisco Regional Office
U.S. Post Office, Yosemite National Park

State of California

Office of Planning and Research, State Clearing House
Department of Fish and Game
Department of Justice, Attorney General
Department of Parks and Recreation, Office of Historic Preservation
Resources Agency of California
American Indian Heritage Commission

Members of Congress

Senator Diane Feinstein
Senator Barbara Boxer
Representative George Radanovich
Representative Gary Condit
Representative John T. Dolittle
Representative George Miller

American Indian Groups
American Indian Council of Mariposa County
Chuckchansi
Mono Lake Paiute
North Fork Mono
Tuolumne Band of Mewuk

County and Local Governments
Groveland
Mariposa
Oakhurst
Madera County
- Board of Supervisors
- Planning Director
- Air Pollution Control District

Mariposa County
- Board of Supervisors
- Planning Department
- Air Pollution Control District
- Sheriff
- Housing and Community Development
- Unified School District

Merced County Association of Governments
Mono County
- Board of Supervisors

Tuolumne County
- Board of Supervisors
- Planning Commission
- Air Pollution Control District
- Sheriff
- Visitor Bureau

Yosemite Area Regional Transportation Strategy
- Management Board
- Technical Review Committee

Yosemite Area Traveler's Information, Inc.
- Management Board

Organizations and Businesses
Best's Studio (Ansel Adam's Gallery)
California Wilderness Coalition
Central Sierra Planning Council
Chapman Associates
El Portal Chevron
El Portal Market
Earth Island Institute
Environmental Defense Fund
Environment Now
Friends of the Earth
Friends of the River
Friends of Yosemite
Highway 120 Association
Mariposa Chamber of Commerce
Mendocino Environmental Association
Mystix
National Audubon Society
National Park's and Conservation Association
- National Office
- Pacific Regional Office

National Resources Defense Council
National Tour Association
Planning and Conservation League
Save-the-Redwoods League
Service Employee International Union
- Local 752

Sierra Club
- Loma Prieta Chapter
- Merced Chapter
- National Office
- Tehipite Chapter
- Tuolumne Group
- Yosemite Committee

Sierra Club Legal Defense Fund
Sierra Recreation Association
Southern Yosemite Visitor's Bureau
Trust for Public Land
Tuolumne River Preservation Trust
Via Adventures, Inc.
Wawona Property Owner's Association
The Wilderness Society
- California/Nevada Region
- National Office

Yosemite Action
Yosemite Association
Yosemite Concession Services
Yosemite Institute
Yosemite Fund
Yosemite Medical Group
Yosemite National Institute
Yosemite National Park Society
Yosemite Restoration Trust
Yosemite Valley Railroad Company
Yosemite West

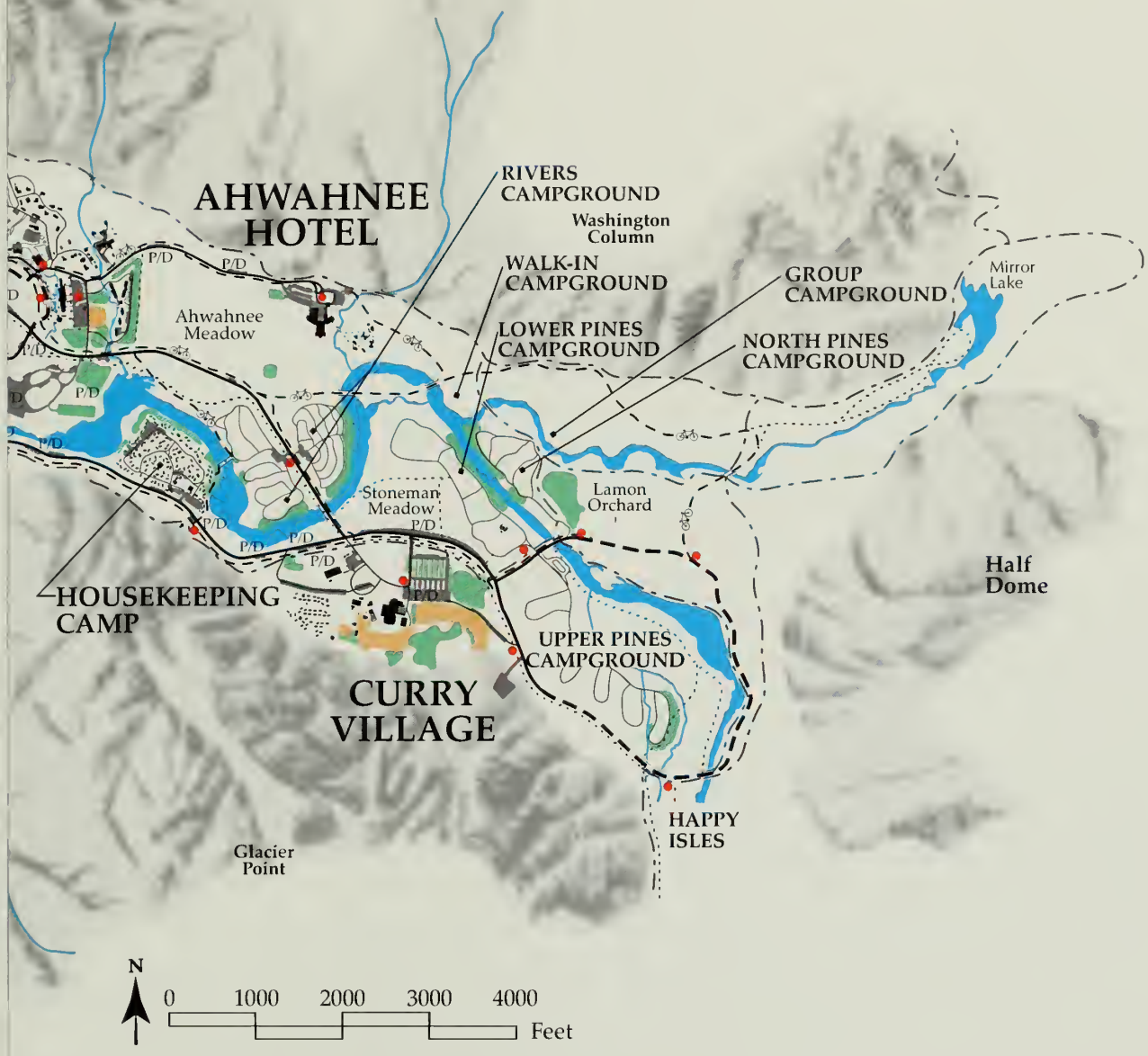
Local Libraries
Groveland
Mariposa
- Yosemite Valley Branch
- El Portal Branch

Oakhurst
Yosemite National Park Research Library

Repository Libraries
Alameda County Library
Contra Costa County Library
  Concord Branch
Los Angeles Library
  Central Branch
Marin County Library
  Main Branch
Orange County
  Heritage Park Regional Library
Riverside Library
  Main Branch
Sacramento County Library
  Central Branch
San Bernardino County Library
  Main Branch
San Diego Library
  Main Branch
San Francisco Library
  Main Branch
San Jose Library
  Main Branch
San Mateo County Library
University of California at Berkeley
  Main Library
University of California at Davis
  Shields Library
University of California at Los Angeles
  University Research Library

Newspapers
Bakersfield Californian
Contra Costa Times
Fresno Bee
Los Angeles Times
Merced Sun-Star
Modesto Bee
Sacramento Bee
San Francisco Chronicle
San Francisco Examiner
San Jose Mercury News
The Sacramento Union

The names of individuals receiving the draft document and addendum are available upon request.



Alternative 1

No Action

VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,270



Alternative 1
No Action
VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA
United States Department of the Interior • National Park Service
DSC/June 1997/104/20,270



Alternative 2

The Proposed Action

VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,277



Alternative 2

The Proposed Action

VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,277

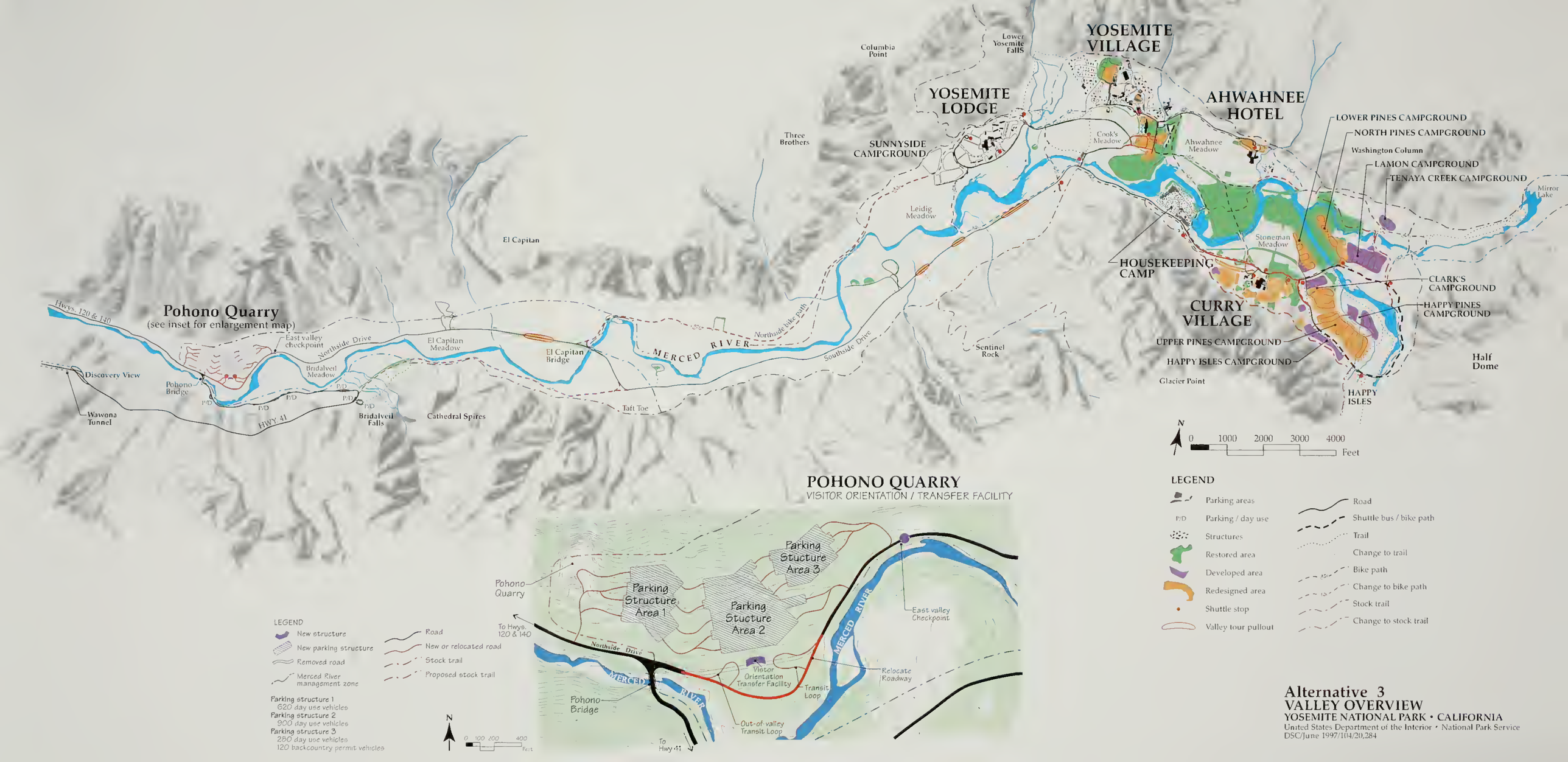


LEGEND

- Parking areas
- P/D — Parking / day use
- Structures
- Restored area
- Developed area
- Redesigned area
- Shuttle stop
- Valley tour pullout
- Road
- Shuttle bus / bike path
- Trail
- Change to trail
- Bike path
- Change to bike path
- Stock trail
- Change to stock trail

Alternative 3
VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,284



Alternative 3
VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,284

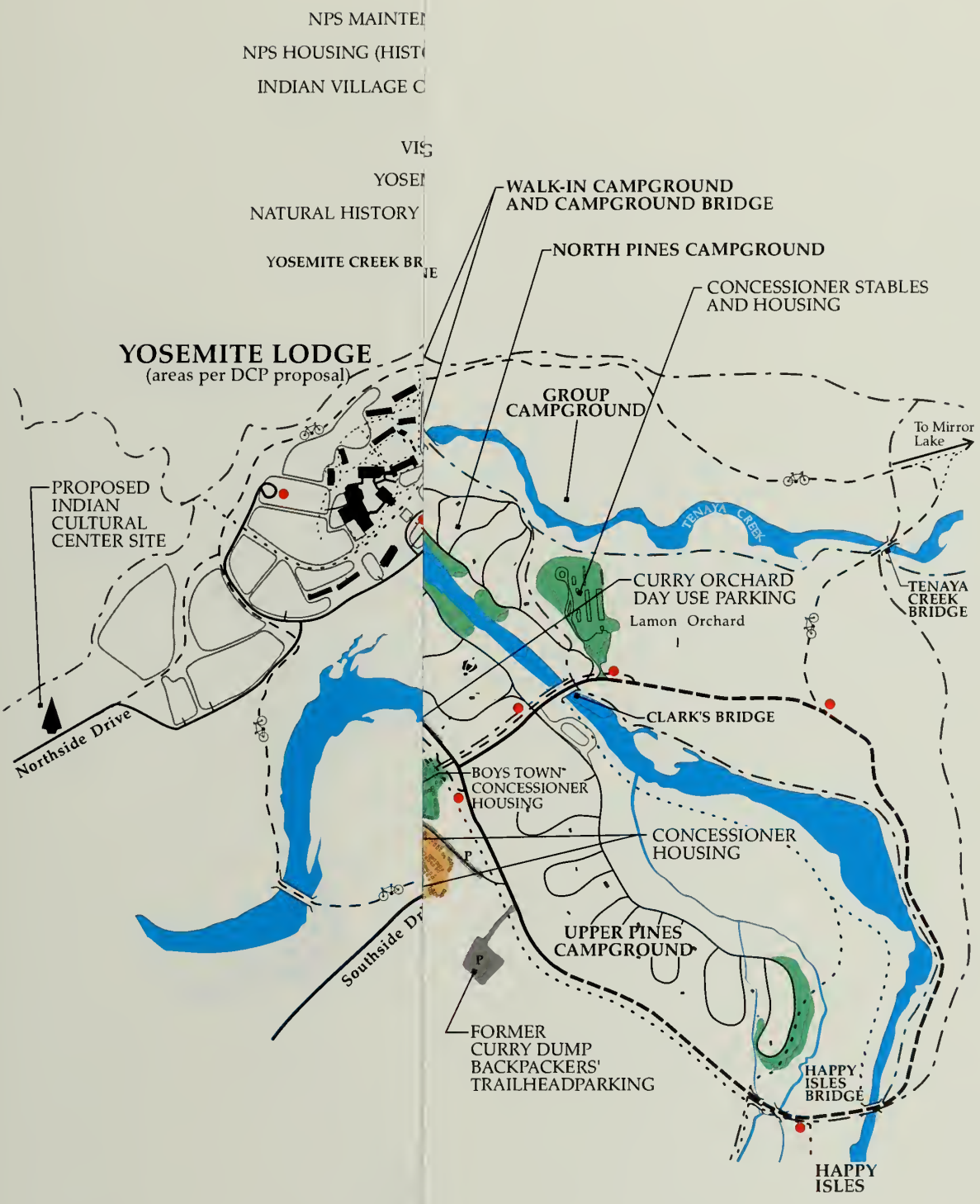


Alternative 4
Minimum Requirements
VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,291



Alternative 4
Minimum Requirements
VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA
United States Department of the Interior • National Park Service
DSC/July 1997/104/20,291



Alternative 1

No Action

EAST VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,271



Alternative 1
No Action
EAST VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,271



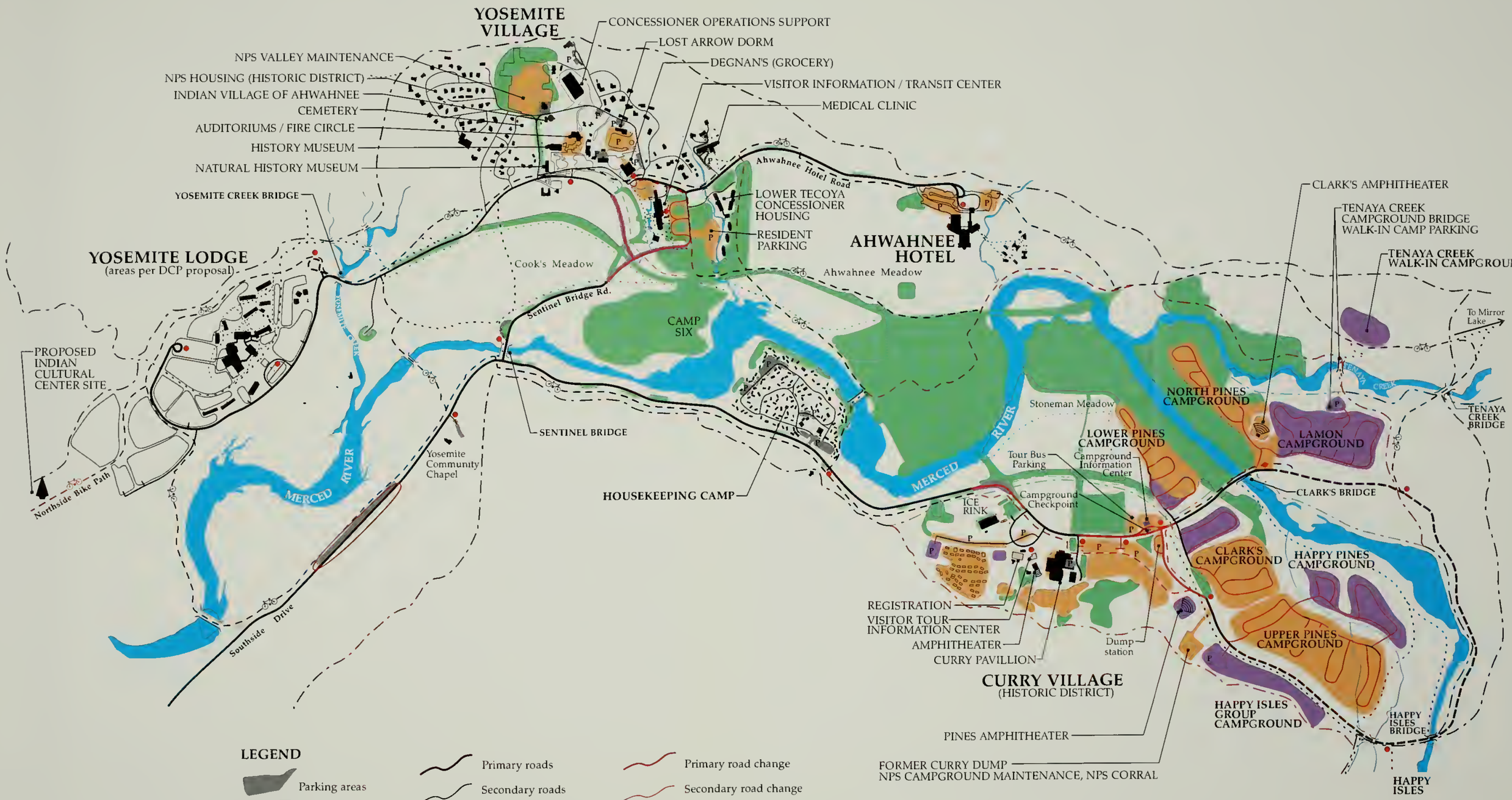
Alternative 2

The Proposed Action

EAST VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,278



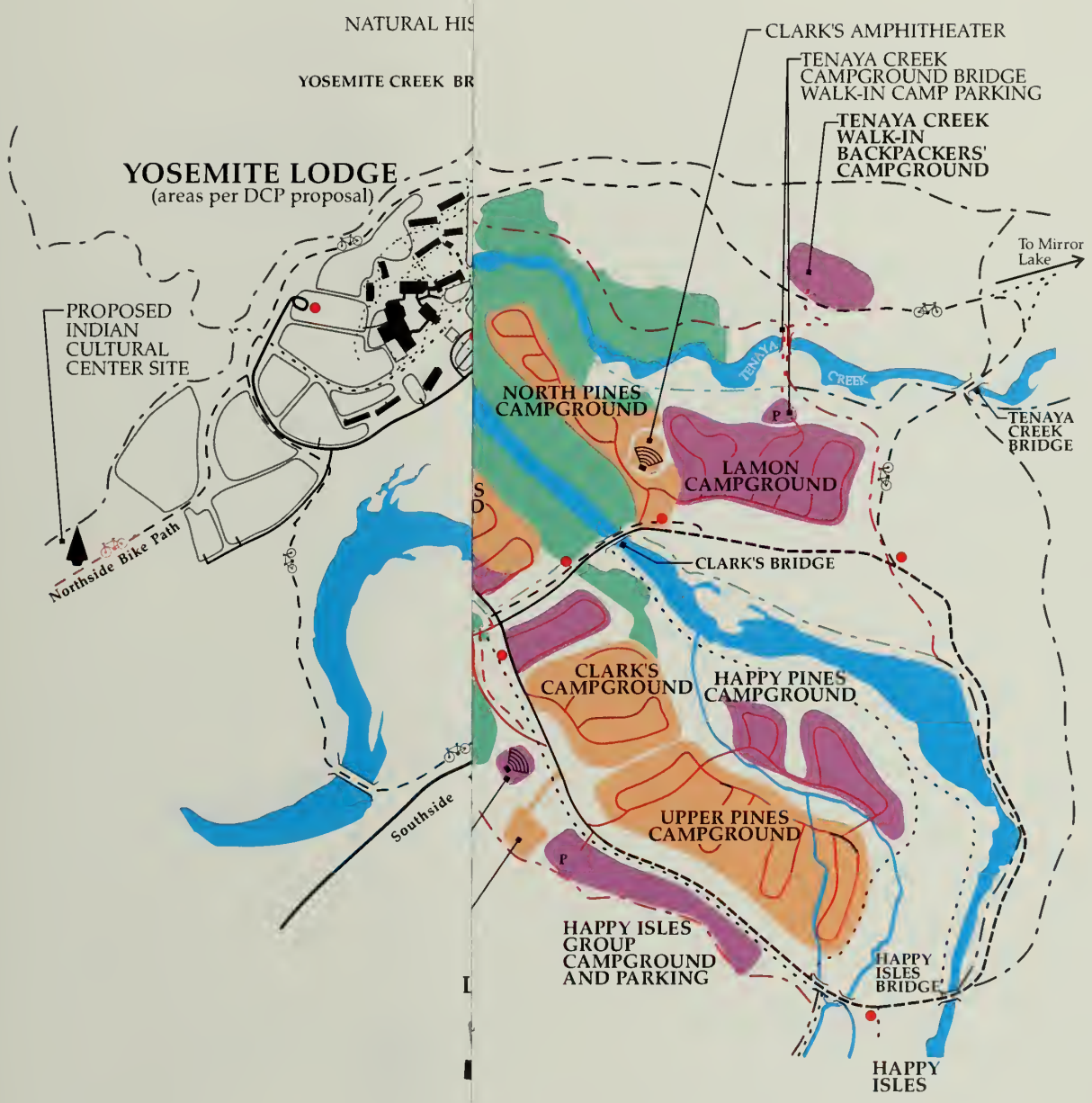
Alternative 2

The Proposed Action

EAST VALLEY OVERVIEW

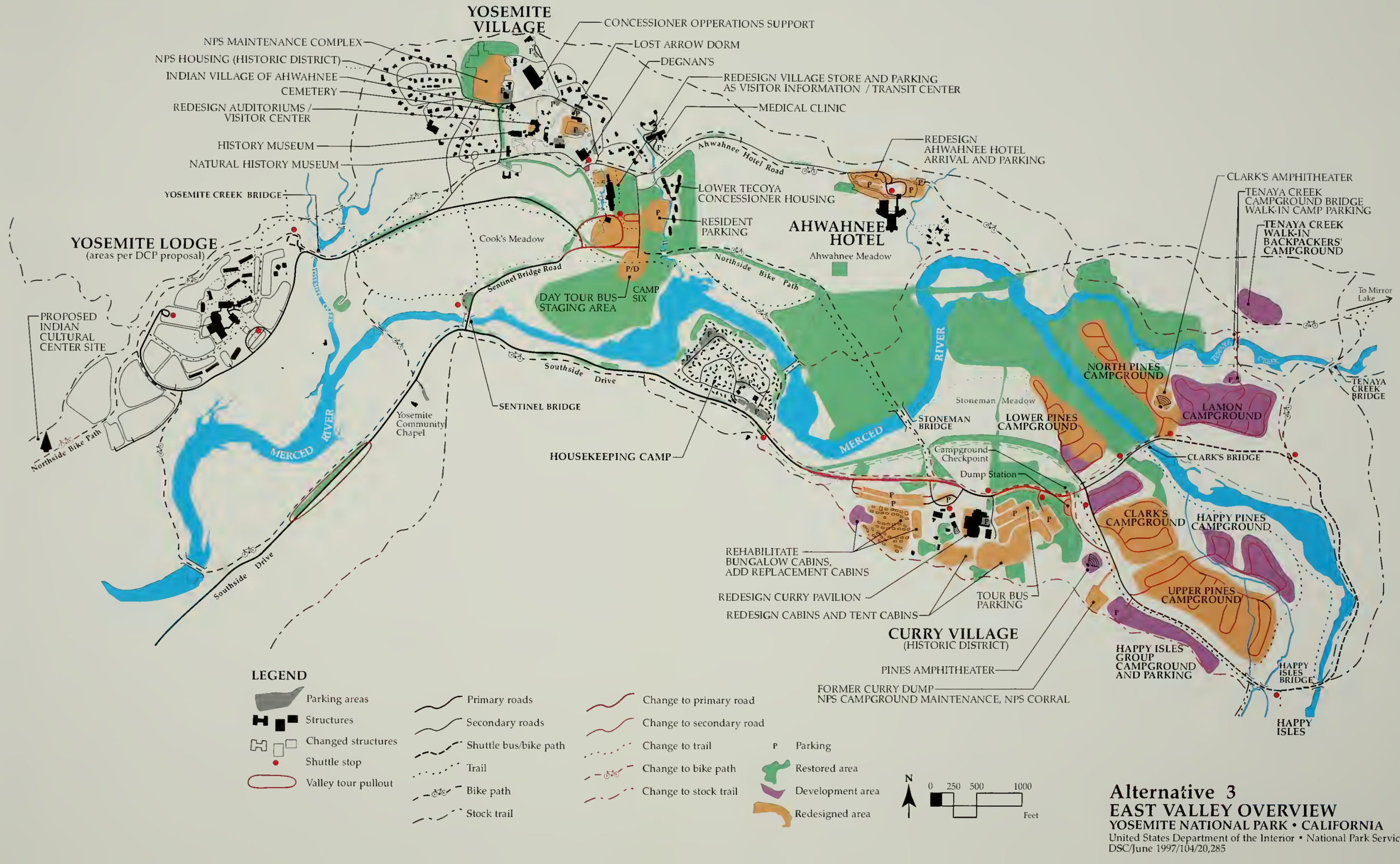
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,278



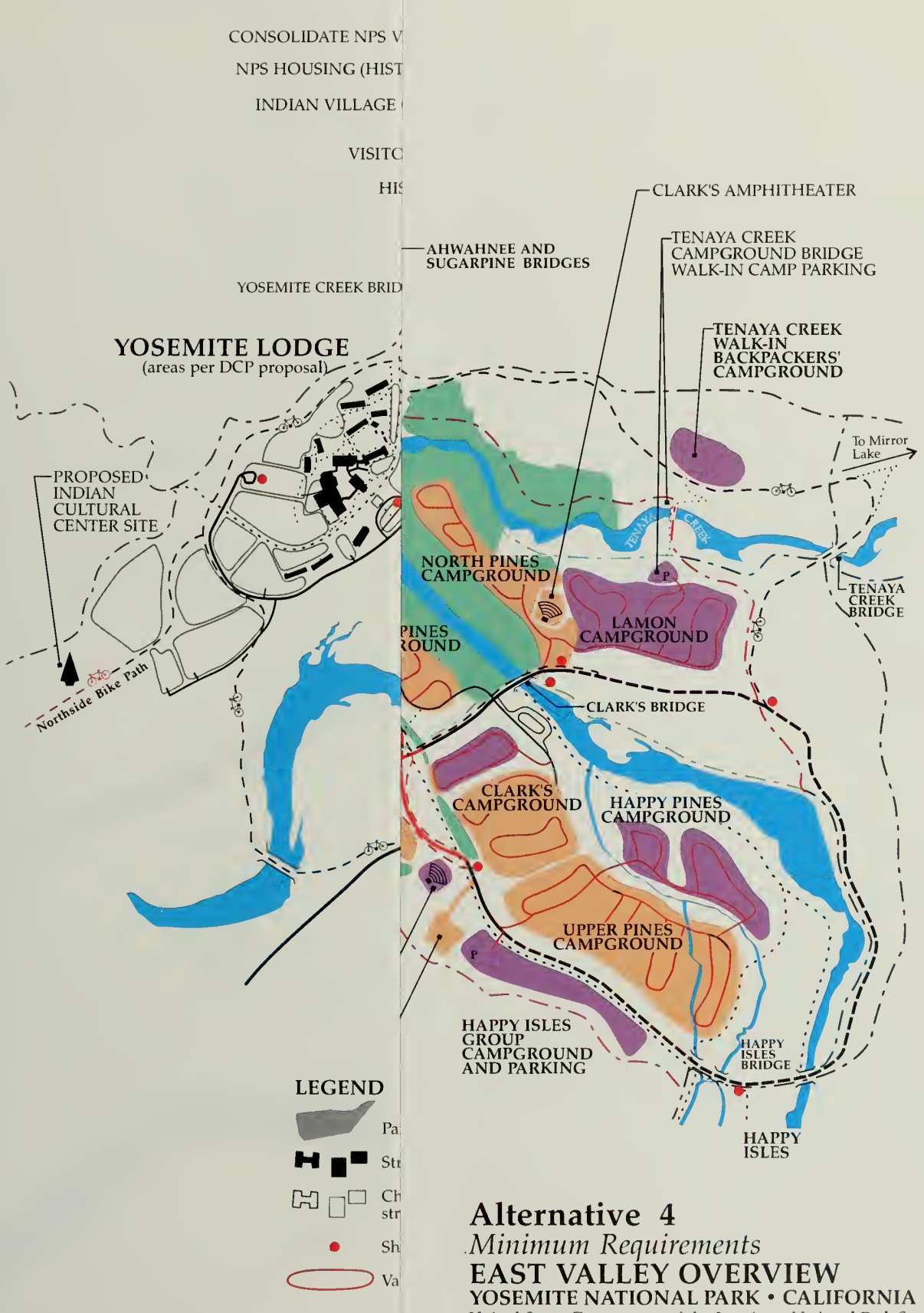
Alternative 3
EAST VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,285



Alternative 3
EAST VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,285



Alternative 4

Minimum Requirements

EAST VALLEY OVERVIEW

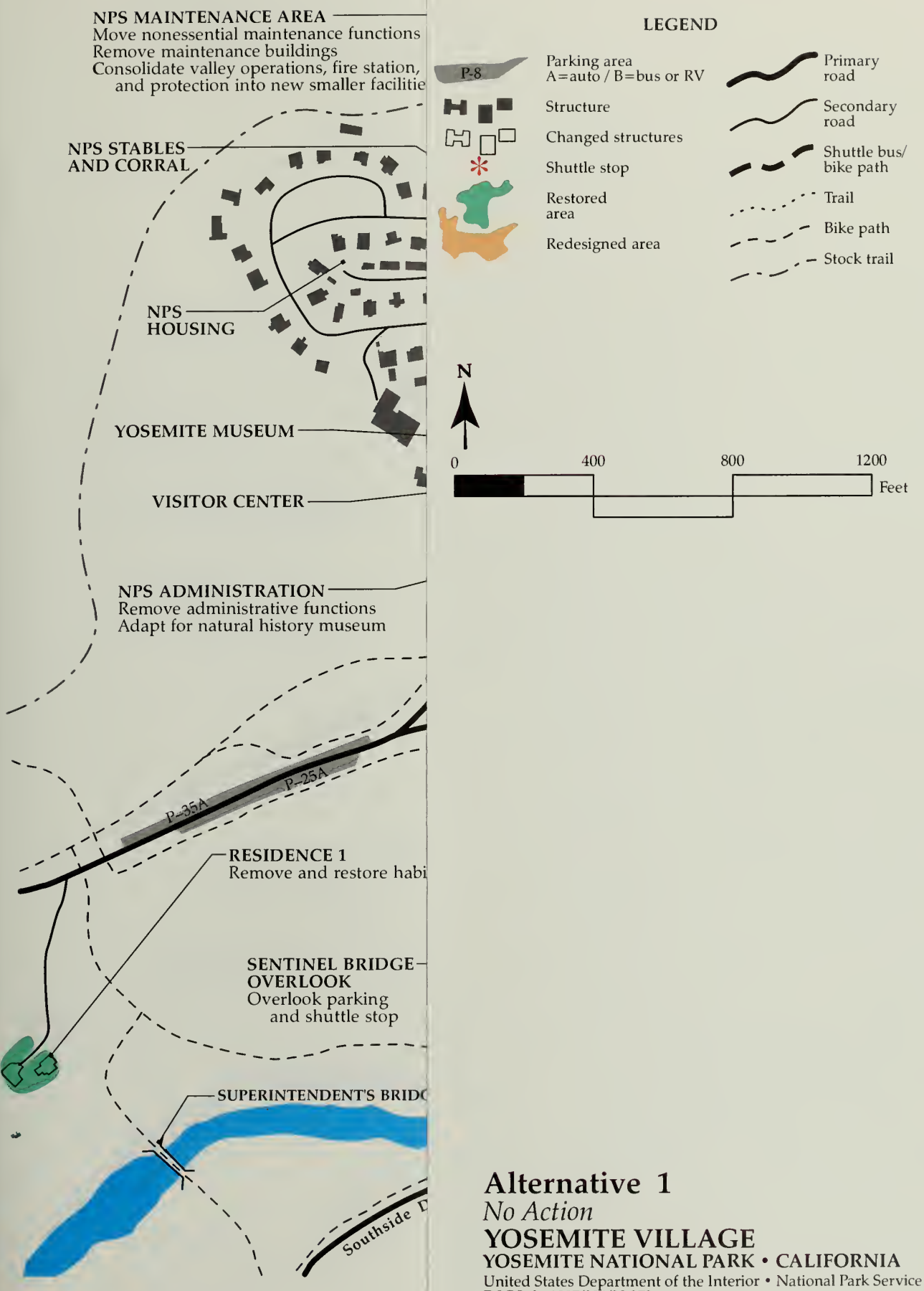
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,292



Alternative 4
Minimum Requirements
EAST VALLEY OVERVIEW
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,292



Alternative 1
No Action
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,272

NPS MAINTENANCE AREA
Move nonessential maintenance functions to El Portal
Remove maintenance buildings
Consolidate valley operations, fire station, and protection into new smaller facilities

NPS STABLES AND CORRAL

NPS HOUSING

YOSEMITE MUSEUM

VISITOR CENTER

NPS ADMINISTRATION
Remove administrative functions
Adapt for natural history museum

RESIDENCE 1
Remove and restore habitat

SENTINEL BRIDGE OVERLOOK
Overlook parking and shuttle stop

SUPERINTENDENT'S BRIDGE

SENTINEL BRIDGE

CONCESSIONER ADMINISTRATION
Remove building and parking lot

UPPER TECOYA
NPS/CONCESSIONER HOUSING

LOST ARROW DORM
CONCESSIONER HOUSING

DEGNAN'S

VILLAGE STORE AND PARKING AREA

MIDDLE TECOYA
NPS/CONCESSIONER HOUSING

MEDICAL CLINIC

LOWER TECOYA
Concessioner dorms and apartments

AHWAHNEE ROW HOUSES AND APARTMENTS
Remove concessioner housing
64 beds

FIRE STATION
Relocate to NPS maintenance area

REMOVE VALLEY GARAGE
Relocate service/gas station here from Yosemite Lodge

REMOVE INDIAN CREEK APARTMENTS AND PARKING

CAMP SIX

P-42A
P-7A
Cemetery
P-5A
Indian Village of Ahwahnee
P-8A
P-18A
P-73A
P-17A
P-12A
P-64A
P-17A
P-87A
P-92A
P-47A
P-3A
P-10A
P-460A / 30B
P-88A
P-26A
P-4A
P-15A
P-9A
P-35A
P-25A
P-19A

Ahwahnee Hotel Road
Bike path to Ahwahnee
Northside Drive
Sentinel Bridge Road
Southside Drive
Bike path to Curry Village
Cook's Meadow

MERCED RIVER

LEGEND

P-8 Parking area A=auto / B=bus or RV
Structure
Changed structures
Shuttle stop
Restored area
Redesigned area
Primary road
Secondary road
Shuttle bus/ bike path
Trail
Bike path
Stock trail

N

0 400 800 1200 Feet

Alternative 1
No Action
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,272



Alternative 2

The Proposed Action

YOSEMITE VILLAGE

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,279

NPS MAINTENANCE AREA
Move nonessential maintenance functions to El Portal
Remove maintenance buildings
Consolidate valley operations, fire station, and protection into smaller facilities
Develop concessioner replacement dorms

VISITOR CENTER
Remove building, retain and renovate auditoriums
Develop outdoor gathering area and fire circle

LOST ARROW DORM & VISITOR CENTER PARKING LOT
Redevelop concessioner dorm
Reconfigure parking

NPS STABLES AND CORRAL
Remove structures
Restore habitat

DEGNAN'S
Increase grocery function
Remove food/deli service
Reduce loading dock area

Cemetery

Indian Village of Ahwahnee

HISTORY MUSEUM
Renovate museum

NPS HEADQUARTERS
Remove administrative functions from valley
Adapt for natural history museum

Ahwahnee Hotel Road

FIRE STATION
Remove fire station and related structures
Restore woodland

COOK'S MEADOW ROAD
Remove road
Restore oak woodland
Realign to shuttle loop road

AHWAHNEE ROW HOUSES
Remove concessioner row houses and apartments
Remove adjacent parking and vehicle access
Restore forest/meadow edge
Relocate bike path from meadow edge

TRANSIT

STATION

VILLAGE STORE AND PARKING AREA
Renovate as visitor information/transit center
Develop interpretive functions and exhibits
Develop food/deli service
Relocate grocery function to Degnan's and Curry Village

VALLEY GARAGE
Remove Valley Garage
Restore woodland
Redevelop for resident parking

INDIAN CREEK APARTMENTS AND PARKING
Remove concessioner dorm and parking
Restore habitat

CONCESSIONER ADMINISTRATION
Remove building and parking lot
Restore woodland

Cook's Meadow

NORTHSIDE DRIVE
Remove and restore meadow

SENTINEL BRIDGE ROAD
Realign for more direct access to transit center
Restore wetland

Sentinel Bridge Road

CAMP SIX
Remove parking
Remove construction staging
Restore Merced River management zone
Restore upland woods and riparian vegetation

CAMP SIX

SUPERINTENDENT'S BRIDGE

SENTINEL BRIDGE

RIVER

MERCED

Southside Drive

Bike path to Curry Village

RESIDENCE 1
Remove and restore habitat

SENTINEL BRIDGE OVERLOOK
Remove all but handicapped parking, retain as shuttle stop

LEGEND

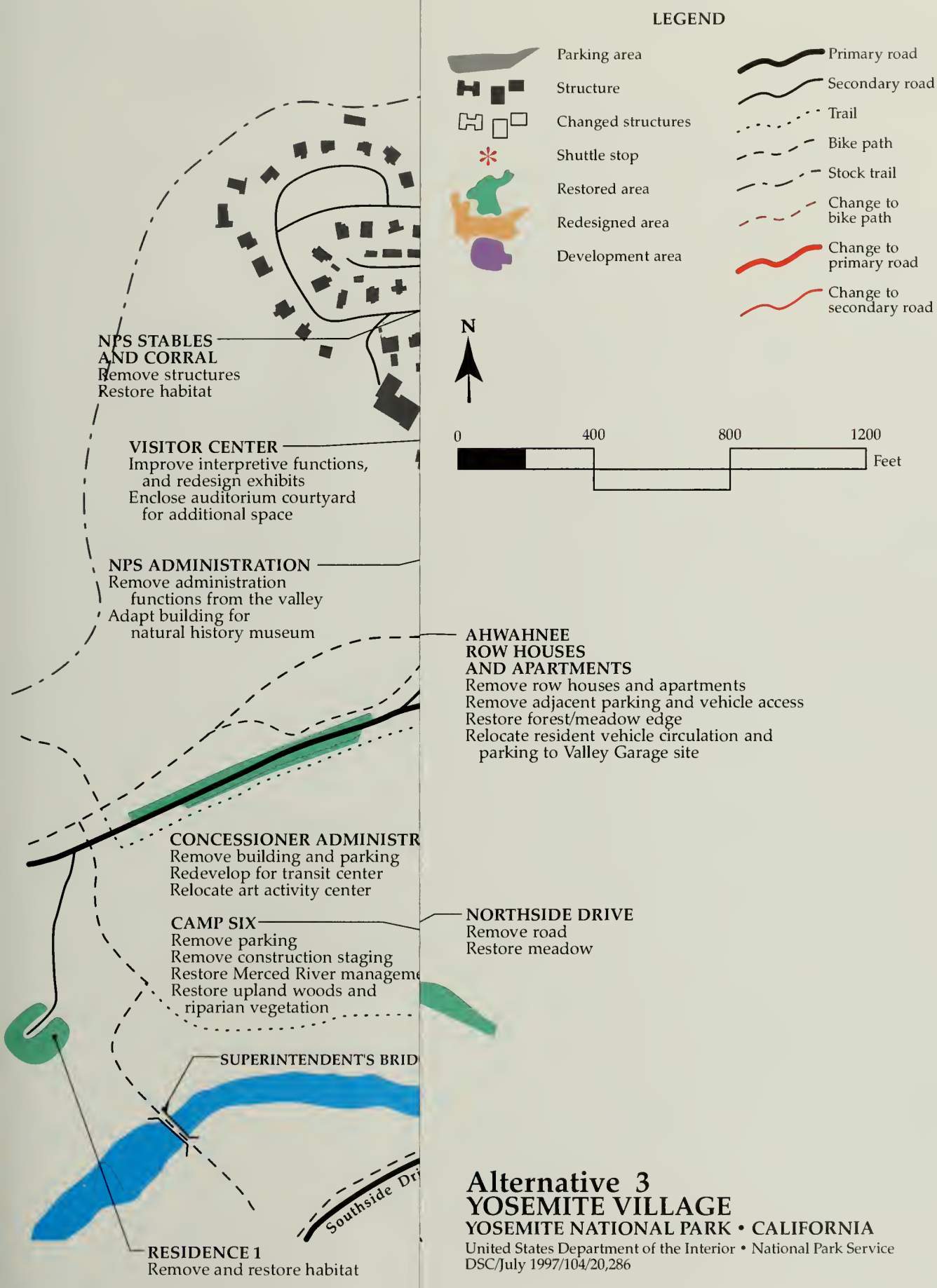
- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Development area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to primary road
- Change to secondary road

N

0 400 800 1200 Feet

Alternative 2
The Proposed Action
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,279



Alternative 3
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,286

NPS MAINTENANCE AREA
Move nonessential maintenance functions to El Portal
Remove maintenance buildings
Consolidate valley operations, fire station, and protection into smaller facilities

LOST ARROW DORM
Renovate dorm
Reconfigure parking

DEGNAN'S
Enlarge restaurant function

SHUTTLE STOP / TURNAROUND

NPS STABLES AND CORRAL
Remove structures
Restore habitat

Cemetery

Indian Village of Ahwahnee

VISITOR CENTER
Improve interpretive functions, and redesign exhibits
Enclose auditorium courtyard for additional space

NPS ADMINISTRATION
Remove administration functions from the valley
Adapt building for natural history museum

SHUTTLE ROAD
Relocate shuttles to Northside Drive and remove road
Restore oak woodland

Ahwahnee Hotel Road

FIRE STATION
Remove fire station and related structures
Restore woodland

Northside Drive

VILLAGE STORE AND PARKING
Renovate as visitor information center
Retain grocery function
Remove visitor parking
Restore habitat

AHWAHNEE ROW HOUSES AND APARTMENTS
Remove row houses and apartments
Remove adjacent parking and vehicle access
Restore forest/meadow edge
Relocate resident vehicle circulation and parking to Valley Garage site

FIRE STATION VALLEY GARAGE
Remove Valley Garage
Relocate fire station to maintenance area
Redevelop for resident parking

TRANSIT STATION

CONCESSIONER ADMINISTRATION
Remove building and parking
Redevelop for transit center
Relocate art activity center

INDIAN CREEK APARTMENTS AND PARKING
Remove concessioner dorm and parking
Restore habitat

Cook's Meadow

CAMP SIX
Remove parking
Remove construction staging
Restore Merced River management zone
Restore upland woods and riparian vegetation

Sentinel Bridge Road

NORTHSIDE DRIVE
Remove road
Restore meadow

CAMP SIX

DAY TOUR BUS STAGING AREA
(20 buses)

SUPERINTENDENT'S BRIDGE

SENTINEL BRIDGE

MERCED RIVER

Southside Drive

Bike Path to Curry Village

SENTINEL BRIDGE OVERLOOK
Remove all but handicapped parking, retain as shuttle stop

RESIDENCE 1
Remove and restore habitat

LEGEND

- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Development area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to primary road
- Change to secondary road

N

0 400 800 1200 Feet

Alternative 3
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,286



Alternative 4
Minimum Requirements
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,293

NPS MAINTENANCE COMPLEX
Remove nonessential maintenance functions to El Portal
Remove maintenance buildings
Consolidate valley operations, fire station, and protection into smaller facilities

LOST ARROW DORM AREA
Renovate dorm
Reconfigure parking

DEGNAN'S

VILLAGE STORE AND PARKING AREA
Retain store
Develop 441 day use parking spaces
Develop out-of-park vehicle transit center stop

NPS STABLES AND CORRAL

Cemetery

Indian Village of Ahwahnee

VISITOR CENTER
Update and renovate exhibits

HISTORY MUSEUM
Renovate exhibits

NATURAL HISTORY MUSEUM
Remove administration functions from the valley
Redevelop as natural history museum

VALLEY GAS STATION
Relocate service / gas station here from Yosemite Lodge

Ahwahnee Hotel Road

AHWAHNEE ROW HOUSES AND APARTMENTS
Remove row houses and apartments
Restore forest/meadow edge

SHUTTLE LOOP

CONCESSIONER HOUSING
Retain housing
Retain parking areas

FIRE STATION VALLEY GARAGE
Remove concessioner fire station
Remove Valley Garage
Replace with 442 day use parking spaces

Northside Drive

CONCESSIONER ADMINISTRATION
Remove building and parking
Replace with day use parking

INDIAN CREEK APARTMENTS AND PARKING
Remove concessioner dorm and parking
Replace with day use parking

RESIDENCE 1
Remove structures and restore habitat

Cook's Meadow

SENTINEL BRIDGE OVERLOOK
Remove all but handicapped parking, retain as shuttle stop

Sentinel Bridge Road

CAMP SIX
Remove construction staging
Develop 600 day use parking spaces/ 20 tour bus parking spaces
Restore upland woods and riparian vegetation

CAMP SIX

SUPERINTENDENT'S BRIDGE

SENTINEL BRIDGE

MERCED RIVER

Southside Drive

Bike path to Curry Village

LEGEND

- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Development area
- Primary road
- Secondary road
- Shuttle bus / bike path
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to primary road
- Change to secondary road

N

0 400 800 1200 Feet

Alternative 4
Minimum Requirements
YOSEMITE VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,293



HOUSEKEEPING CAMP (232 lodging units)
Remove riverside lodging units
Redesign to improve circulation and reduce density
Restore riverbank

LE CONTE MEMORIAL

PEDESTRIAN BRIDGE

HUFF HOUSE AND PA
Remove parking and concessioner housing
Restore habitat

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LEGEND

- P8-A — Parking area A=auto / B=bus
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Resdesigned area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail

N

0 400 800 1200 Feet

INTERPRETIVE AMPHITHEATER

CONCESSIONER HOUSING
Remove Boys Town — 170 double tent cabins
Restore habitat

CONCESSIONER HOUSING
Remove Terrace tent cabins — 150 double tent cabins

FORMER CURRY DUMP
BACKPACKERS' TRAILHEAD PARKING
Relocated concessioner stables

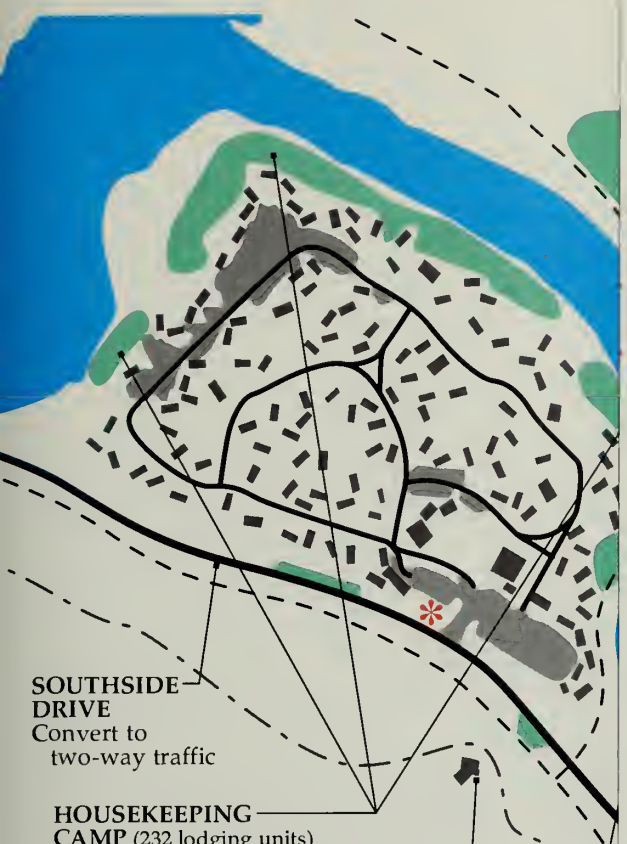
Alternative 1
No Action
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,273



Alternative 1
No Action
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,273



SOUTHSIDE DRIVE
Convert to two-way traffic

HOUSEKEEPING CAMP (232 lodging units)
Remove riverside units
Redesign to improve circulation and reduce density
Restore riverbank

LE CONTE MEMORIAL

PEDESTRIAN BRIDGE

HUFF HOUSE AND PARKING
Remove house, parking, and access road (concessioner housing 5 beds)
Restore habitat

WEST PARKING
Improve parking and provide ad

CABINS WITH BATH
Rehabilitate cabins (103 roo
Provide replacement for Sto

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LEGEND

- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Resdesigned area
- Development area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to stock trail
- Change to primary road
- Change to Secondary road

N

0 400 800 1000 Feet

CAMPGROUND CHECKPOINT
Remove Boys Town tent cabin housing (170 double tent cabins)
Add new road through Boys Town to Clark's Bridge
Add campground information center and checkpoint
Add overnight tour bus parking (6 buses)

DUMP STATION

TENT CABIN AND GUEST PARKING
Reduce density and number of tent cabins (remove 276, retain 150)
Provide additional parking for overnight guests

REALIGN BIKE PATH

CONCESSIONER HOUSING
Remove tent cabins and Cook's tent cabins
Remove Terrace housing (150 double tent cabins)

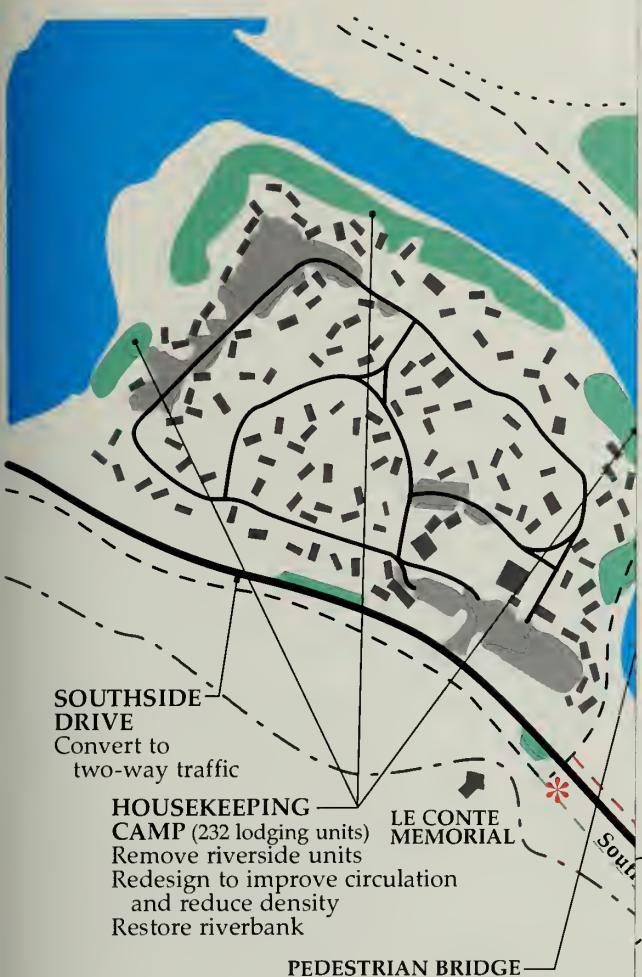
Alternative 2
The Proposed Action
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,280



Alternative 2
The Proposed Action
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,280



SOUTHSIDE DRIVE
Convert to
two-way traffic

HOUSEKEEPING CAMP (232 lodging units)
Remove riverside units
Redesign to improve circulation
and reduce density
Restore riverbank

LE CONTE MEMORIAL

PEDESTRIAN BRIDGE

SOUTHSIDE DRIVE
HUFF HOUSE AND PARKING
Remove road through Stoneman M
Remove Huff House and parking
Realign road and bike path throug
development to Curry Village an

WEST PARKING
Improve parking
Provide additional

CABI
Rehab
Provid
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LEGEND

- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Resdesigned area
- Development area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to stock trail
- Change to primary road
- Change to Secondary road

N

0 400 800 1200 Feet

CONCESSIONER HOUSING
Remove Boys Town
(tent cabin housing, 170 double tent cabins)
Restore habitat

OVERNIGHT GUEST PARKING
Provide parking, including
overnight tour bus parking

CAMPGROUND CHECKPOINT
Add information kiosk
Add new road through Boys Town to Clark's Bridge

CAMPGROUND DUMP STATION
Provide relocated dump station for campgrounds

PINES AMPHITHEATER

FORMER CURRY DUMP
BACKPACKERS' TRAILHEAD PARKING
Redevelop for camp maintenance, NPS corral

Alternative 3
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,287



Alternative 3
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,287



LE CONTE MEMORIAL

HOUSEKEEPING CAMP (232 lodging units)
Remove riverside units
Redesign to improve circulation and reduce density
Restore riverbank

PEDESTRIAN BRIDGE

HUFF HOUSE AND PARKING
Remove parking, concessioner
Restore habitat
Maintain west access road

WEST PARKING
Improve parking
Provide additional parkin

CURRY
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Mitigat

LEGEND

- Parking area
- Structure
- Changed structures
- Shuttle stop
- Restored area
- Resdesigned area
- Development area
- Primary road
- Secondary road
- Trail
- Bike path
- Stock trail
- Change to bike path
- Change to stock trail
- Change to primary road
- Change to Secondary road

N

0 400 800 1200

Feet

CAMPGROUND CHECKPOINT
Add information kiosk

CURRY ORCHARD DAY USE PARKING
Retain parking for 317 day use spaces
Redesign remaining parking spaces, provide for 120 backcountry permit vehicle spaces
Replace orchard with nonfruiting trees

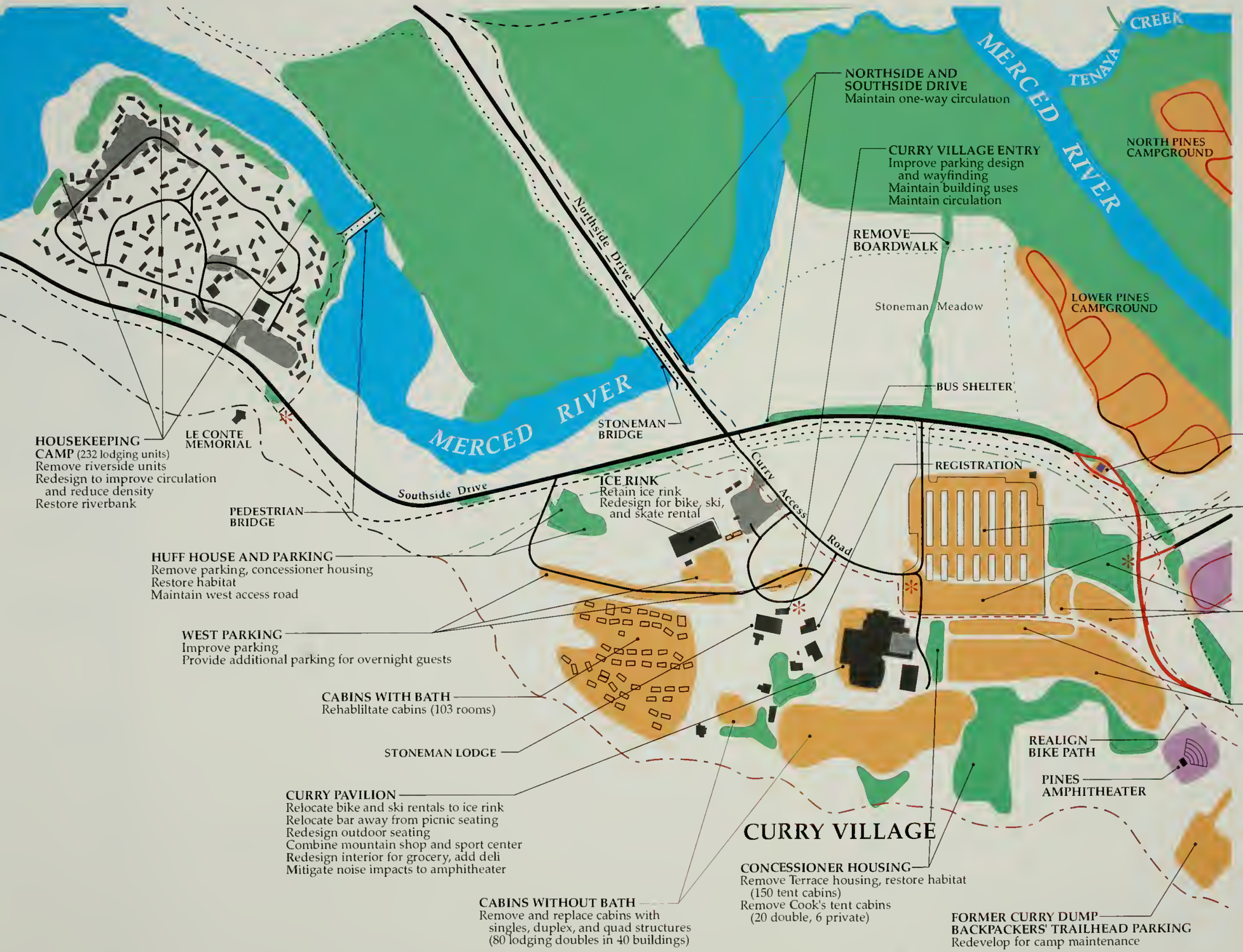
CONCESSIONER HOUSING
Remove Boys Town tent cabin housing (170 double tent cabins)
Restore habitat
Develop parking for lodging and 20 overnight tour buses

C
R

LODGING — TENT CABINS
Reduce density and number of tent cabins (remove 276, retain 150)
Provide additional parking

Alternative 4
Minimum Requirements
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,294



Alternative 4
Minimum Requirements
CURRY VILLAGE
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
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LEGEND

P-8A — Parking area A=auto / B-bus

Structures

Changed structures

Shuttle stop

Restored area

Redesigned area

Primary road

Secondary road

Shuttle bus/ bike path

Trail

Bike path

Stock trail

N

0 300 600 1200 1800

Feet

Alternative 1

No Action

AHWAHNEE HOTEL & CAMPGROUNDS

YOSEMITE NATIONAL PARK• CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,274

AHWAHNEE HOTEL
Remove concessioner dorm
(40 beds and 5 tent cabins)
Restore ponderosa pine forest

AHWAHNEE HOTEL

PORTE CO-CHERE

AHWAHNEE BRIDGE

SUGARPINE BRIDGE

WALK-IN CAMPGROUND
(23 sites)

WALK-IN CAMPGROUND BRIDGE

AHWAHNEE TENNIS COURTS
Remove courts
Restore meadow

Northside Drive

INTERPRETIVE AMPHITHEATER

LOWER PINES CAMPGROUNDS
(162 sites)

NORTH PINES CAMPGROUND
(76 sites)

GROUP CAMPGROUND
(11 sites)

To Mirror Lake

TENAYA CREEK BRIDGE

RIVER EDGE
Remove campsites
adjacent to riverbank

UPPER AND LOWER RIVERS CAMPGROUND
(225 sites remain)

Stoneman Meadow

STONEMAN BRIDGE

CONCESSIONER STABLES
Remove stables and
concessioner housing
(36 double tent cabins, and 1 cabin)

Lamon Orchard

INTERPRETIVE AMPHITHEATER

LE CONTE MEMORIAL

Southside Drive

CLARK'S BRIDGE

CAMPGROUND INFORMATION

DUMP STATION

HOUSEKEEPING CAMP (232 units)

ICE RINK

CURRY ORCHARD DAY USE PARKING

HUFF HOUSE AND PARKING

BOYS TOWN CONCESSIONER HOUSING
Remove tent cabin housing
Restore habitat

PEDESTRIAN BRIDGE

UPPER PINES CAMPGROUND
(221 sites)

CURRY VILLAGE

FORMER CURRY DUMP
BACKPACKERS' TRAILHEAD PARKING
Relocated concessioner stables

HAPPY ISLES BRIDGE

HAPPY ISLES

P-11A P-79A P-9A P-52A P-50A P-9A P-20A P-20A P-74A P-7A P-5A P-14A P-5A P-30A P-48A P-32A P-143A P-86A P-137A P-37A

LEGEND

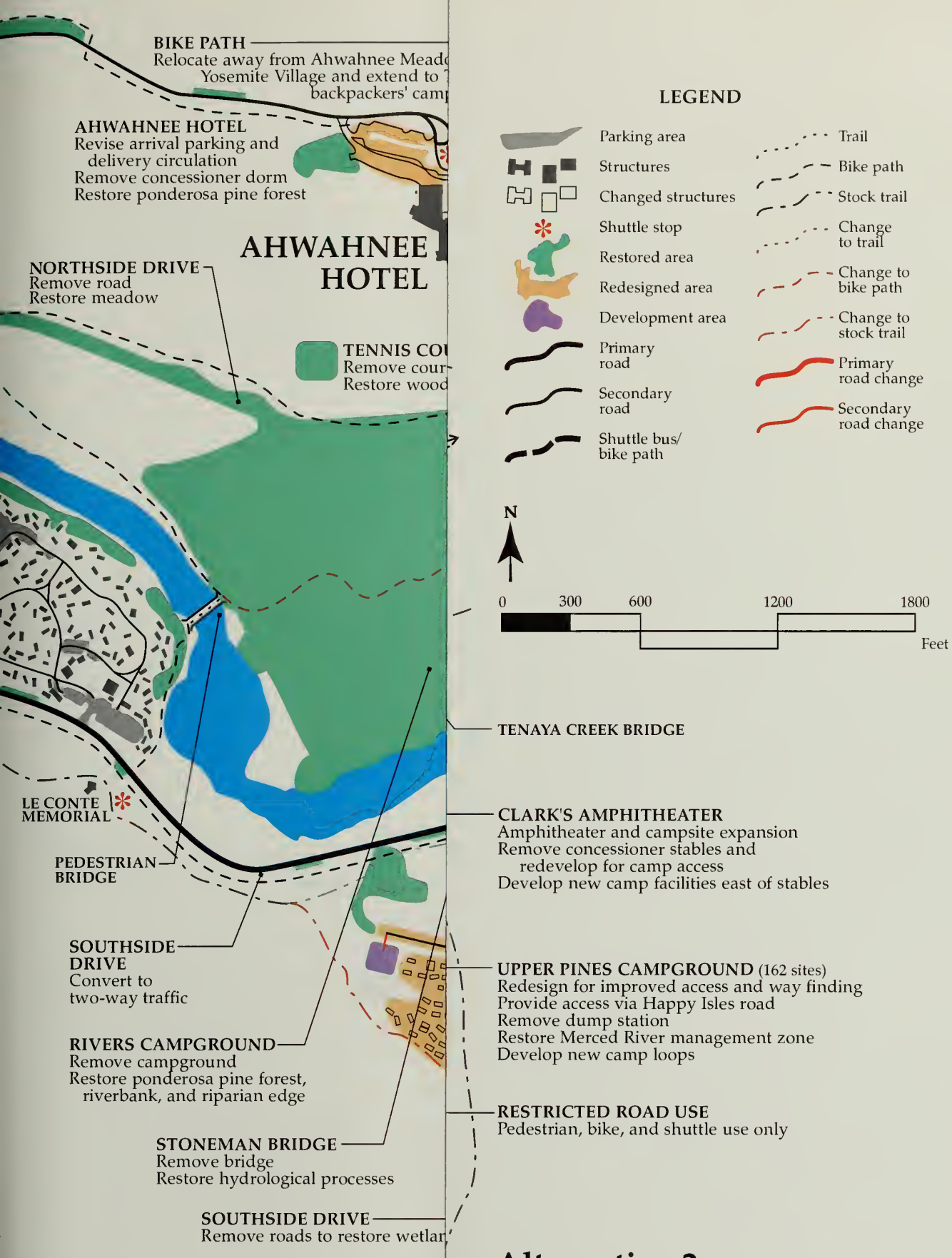
- Parking area (P-8A; A=auto / B-bus)
- Structures
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Primary road
- Secondary road
- Shuttle bus/ bike path
- Trail
- Bike path
- Stock trail

N

0 300 600 1200 1800 Feet

Alternative 1
No Action
AHWAHNEE HOTEL & CAMPGROUNDS
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,274



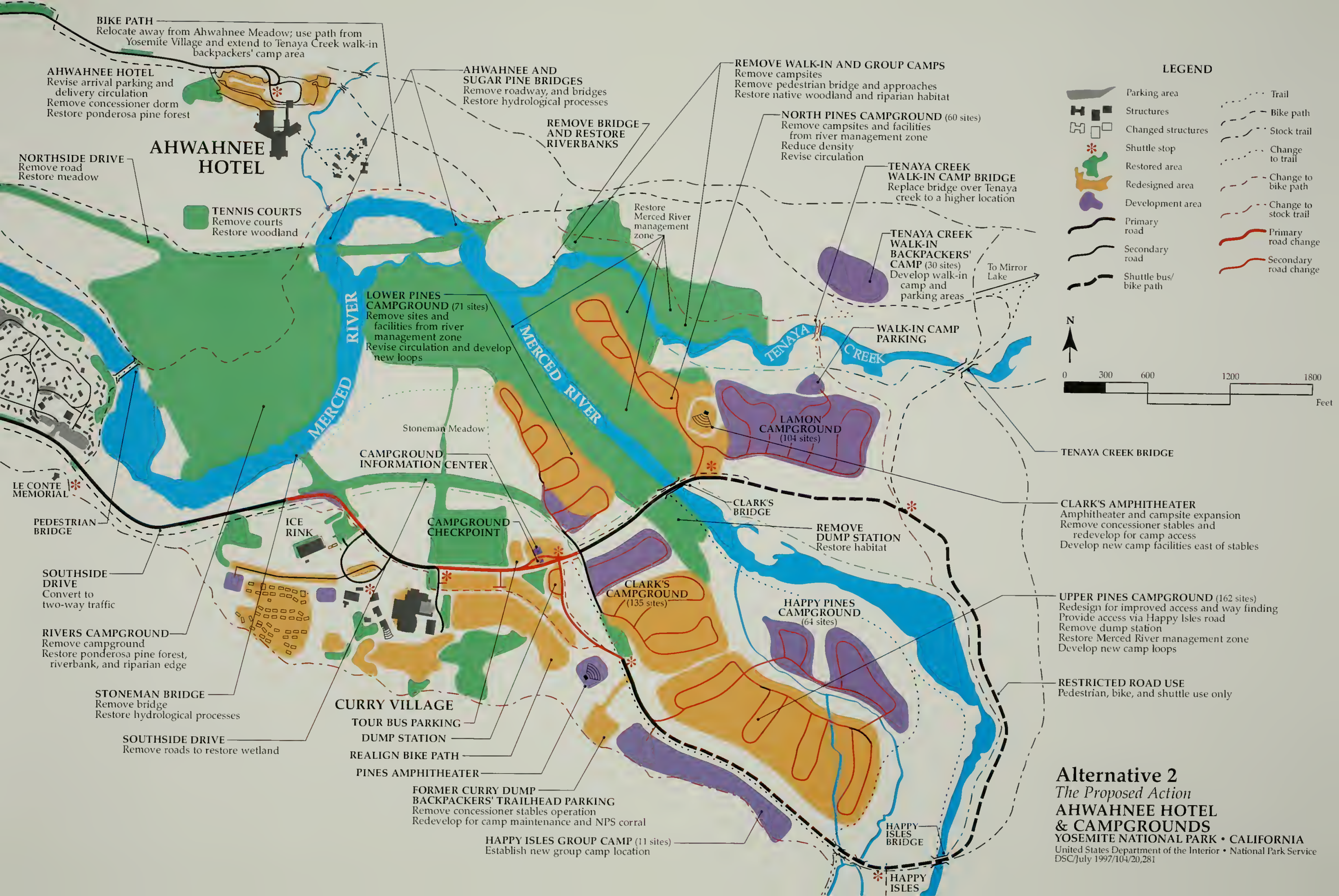
Alternative 2

The Proposed Action

AHWAHNEE HOTEL & CAMPGROUNDS

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,281



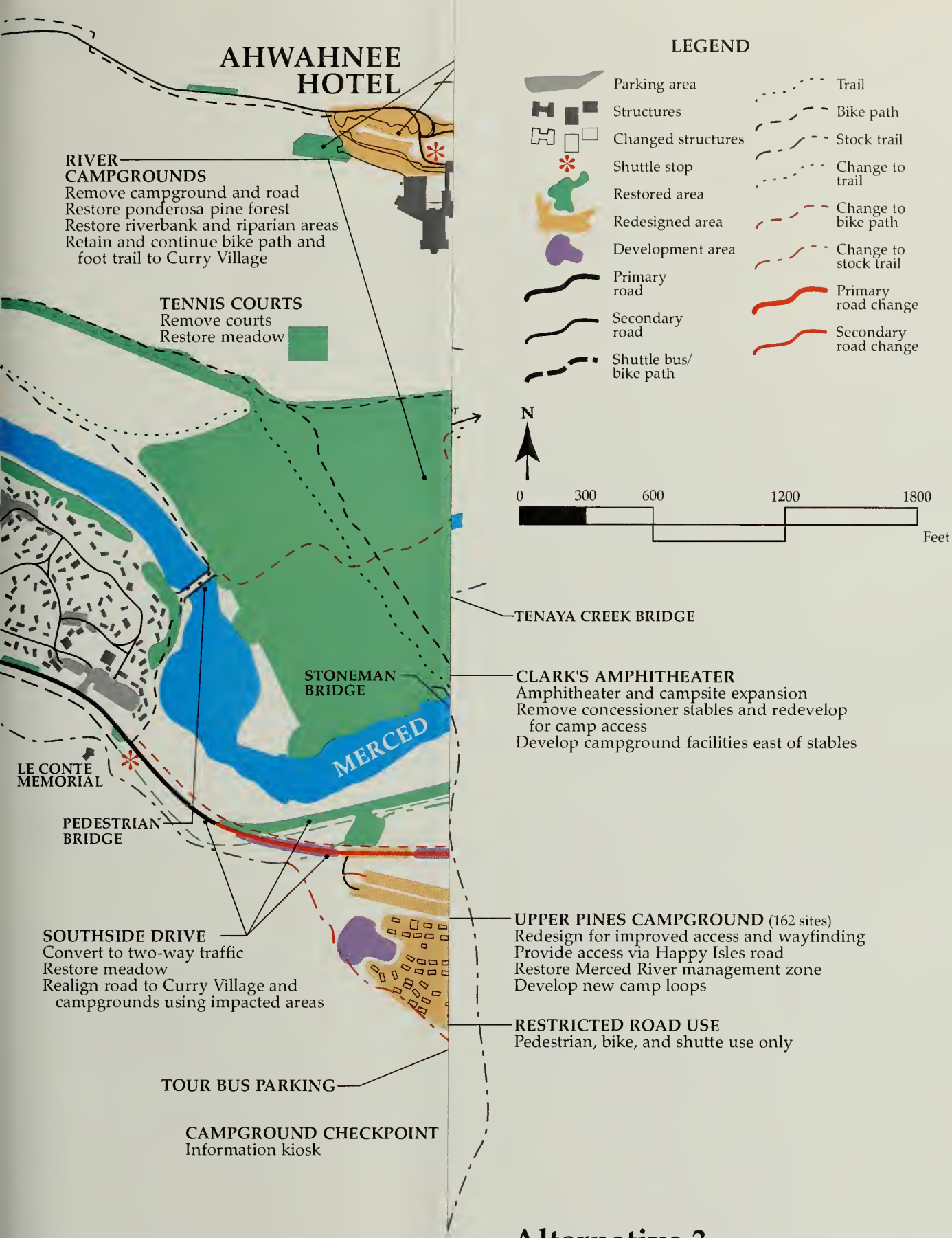
Alternative 2

The Proposed Action

AHWAHNEE HOTEL & CAMPGROUNDS

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,281



Alternative 3
AHWAHNEE HOTEL & CAMPGROUNDS
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
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AHWAHNEE HOTEL

AHWAHNEE HOTEL
Revise arrival, parking, and delivery circulation
Remove concessioner dorm
Restore ponderosa pine forest

BIKE PATH
Relocate away from Ahwahnee Meadow, use path from Yosemite Village, and extend to Tenaya Creek walk-in backpackers' campground

RIVER CAMPGROUNDS
Remove campground and road
Restore ponderosa pine forest
Restore riverbank and riparian areas
Retain and continue bike path and foot trail to Curry Village

AHWAHNEE AND SUGARPINE BRIDGES
Remove roadway, andbridges
Restore hydrological processes

TENNIS COURTS
Remove courts
Restore meadow

REMOVE BRIDGE AND RESTORE RIVERBANKS

Restore Merced River management zone

REMOVE WALK-IN AND GROUP CAMPGROUNDS
Remove campsites
Remove pedestrian bridge and approaches
Restore native woodland and riparian habitat

NORTH PINES CAMPGROUND (60 sites)
Remove campsites and facilities from river management zone
Reduce density
Revise circulation

TENAYA CREEK WALK-IN BACKPACKERS' CAMP BRIDGE
Provide bridge over Tenaya Creek in a higher location

TENAYA CREEK WALK-IN BACKPACKERS' CAMP (30 sites)
Develop walk-in camp

To Mirror Lake

LOWER PINES CAMPGROUNDS (71 sites)
Remove sites and facilities from river management zone
Restore ponderosa pine forest
Revise circulation and develop new loops

MERCED RIVER

TENAYA CREEK

WALK-IN CAMP PARKING

TENAYA CREEK BRIDGE

LAMON CAMPGROUND (104 sites)

CLARK'S AMPHITHEATER
Amphitheater and campsite expansion
Remove concessioner stables and redevelop for camp access
Develop campground facilities east of stables

STONEMAN BRIDGE

Stoneman Meadow

LE CONTE MEMORIAL

PEDESTRIAN BRIDGE

tCE RINK

CLARK'S BRIDGE

REMOVE DUMP STATION
Restore habitat

SOUTHSIDE DRIVE
Convert to two-way traffic
Restore meadow
Realign road to Curry Village and campgrounds using impacted areas

CLARK'S CAMPGROUND (135 sites)

HAPPY PINES CAMPGROUND (64 sites)

UPPER PINES CAMPGROUND (162 sites)
Redesign for improved access and wayfinding
Provide access via Happy Isles road
Restore Merced River management zone
Develop new camp loops

RESTRICTED ROAD USE
Pedestrian, bike, and shutte use only

TOUR BUS PARKING

CAMPGROUND CHECKPOINT
Information kiosk

CURRY VILLAGE

DUMP STATION

PINES AMPHITHEATER

FORMER CURRY DUMP BACKPACKERS' TRAILHEAD PARKING
Redevelop for camp maintenance and NPS corral

HAPPY ISLES GROUP CAMP (11 sites)
Establish group camp and parking

HAPPY ISLES BRIDGE

HAPPY ISLES

LEGEND

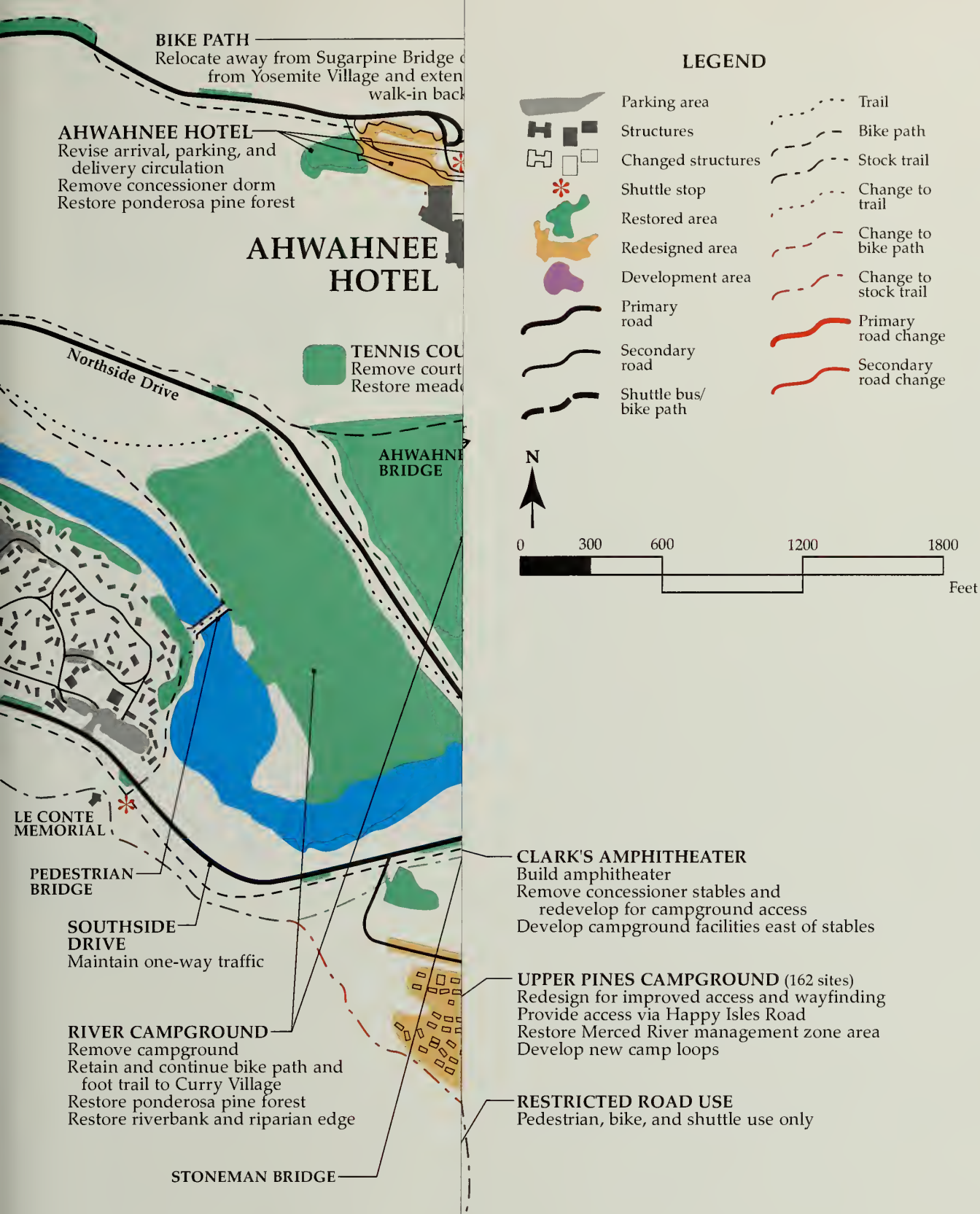
- Parking area
- Structures
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Development area
- Primary road
- Secondary road
- Shuttle bus/ bike path
- Trail
- Bike path
- Stock trail
- Change to trail
- Change to bike path
- Change to stock trail
- Primary road change
- Secondary road change

N

0 300 600 1200 1800 Feet

Alternative 3
AHWAHNEE HOTEL & CAMPGROUNDS
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,288



Alternative 4

Minimum Requirements

AHWAHNEE HOTEL & CAMPGROUNDS

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
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BIKE PATH
Relocate away from Sugarpine Bridge crossing; use path from Yosemite Village and extend to Tenaya Creek walk-in backpackers' camp area

AHWAHNEE HOTEL
Revise arrival, parking, and delivery circulation
Remove concessioner dorm
Restore ponderosa pine forest

AHWAHNEE HOTEL

AHWAHNEE AND SUGARPINE BRIDGES
Remove roadway and bridge approaches
Restore hydrological processes

REMOVE BRIDGE AND RESTORE RIVERBANKS

REMOVE WALK-IN AND GROUP CAMPGROUNDS
Remove campsites
Remove pedestrian bridge and approaches
Restore native woodland and riparian habitat

NORTH PINES CAMPGROUND (60 sites)
Remove campsites and facilities from river management zone
Reduce density
Revise circulation

TENAYA CREEK WALK-IN BACKPACKERS' CAMP BRIDGE
Provide bridge over Tenaya creek in a higher location

TENNIS COURTS
Remove courts
Restore meadow

Northside Drive

Restore Merced River management zone

TENAYA CREEK WALK-IN BACKPACKERS' CAMP (30 sites)
Develop walk-in camp and parking areas

To Mirror Lake

AHWAHNEE BRIDGE

LOWER PINES CAMPGROUND (58 sites)
Remove sites and facilities from river management zone
Restore ponderosa pine forest
Revise circulation and develop new loops

MERCED RIVER

MERCED RIVER

TENAYA CREEK

WALK-IN CAMP PARKING

Stoneman Meadow

CAMPGROUND CHECKPOINT
Information kiosk

LAMON CAMPGROUND (104 sites)

TENAYA CREEK BRIDGE

LE CONTE MEMORIAL

PEDESTRIAN BRIDGE

ICE RINK

CLARK'S BRIDGE

DUMP STATION

CLARK'S AMPHITHEATER
Build amphitheater
Remove concessioner stables and redevelop for campground access
Develop campground facilities east of stables

SOUTHSIDE DRIVE
Maintain one-way traffic

CLARK'S CAMPGROUND (135 sites)

HAPPY PINES CAMPGROUND (64 sites)

UPPER PINES CAMPGROUND (162 sites)
Redesign for improved access and wayfinding
Provide access via Happy Isles Road
Restore Merced River management zone area
Develop new camp loops

RESTRICTED ROAD USE
Pedestrian, bike, and shuttle use only

RIVER CAMPGROUND
Remove campground
Retain and continue bike path and foot trail to Curry Village
Restore ponderosa pine forest
Restore riverbank and riparian edge

STONEMAN BRIDGE

CURRY VILLAGE

TOUR BUS PARKING

PINES AMPHITHEATER

FORMER CURRY DUMP
BACKPACKERS' TRAILHEAD PARKING
Redevelop for camp maintenance

REALIGN BICYCLE TRAIL

HAPPY ISLES GROUP CAMP (11 sites)
Establish group camp and parking

HAPPY ISLES BRIDGE

HAPPY ISLES

LEGEND

- Parking area
- Structures
- Changed structures
- Shuttle stop
- Restored area
- Redesigned area
- Development area
- Primary road
- Secondary road
- Shuttle bus/ bike path
- Trail
- Bike path
- Stock trail
- Change to trail
- Change to bike path
- Change to stock trail
- Primary road change
- Secondary road change

N

0 300 600 1200 1800 Feet

Alternative 4
Minimum Requirements
AHWAHNEE HOTEL & CAMPGROUNDS
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,295



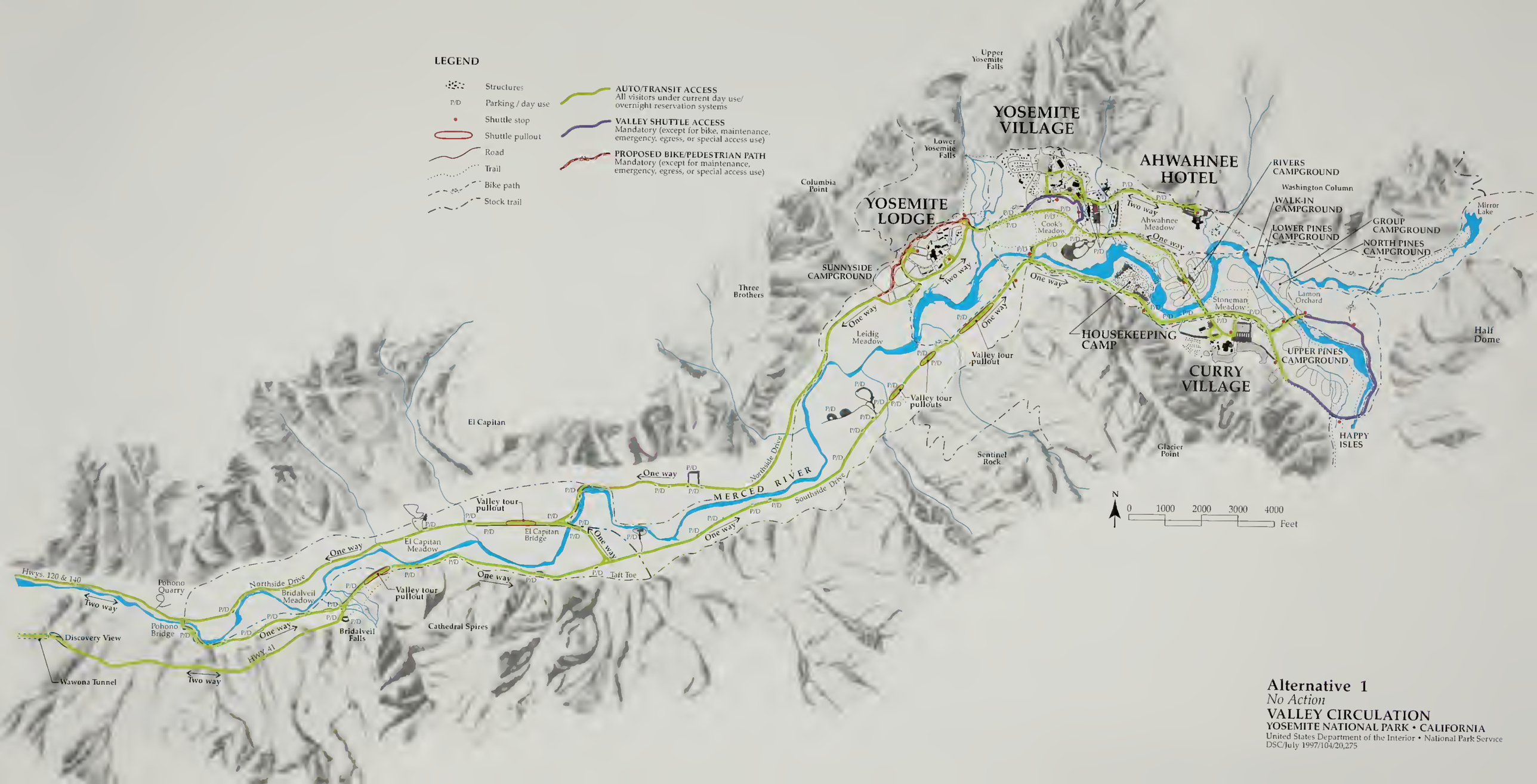
Alternative 1

No Action

VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,275



Alternative 1
No Action
VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA
United States Department of the Interior • National Park Service
DSC/July 1997/104/20,275



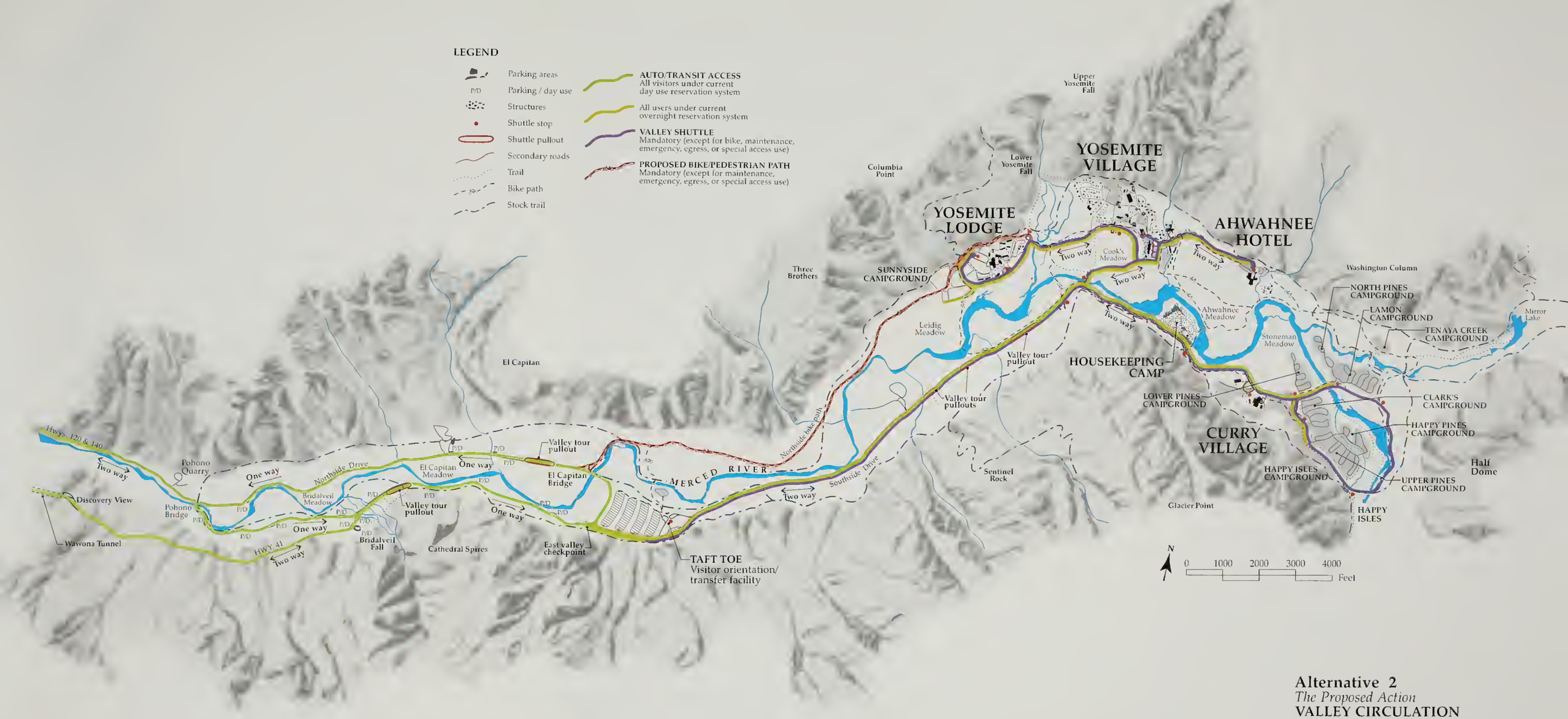
Alternative 2

The Proposed Action

VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,282

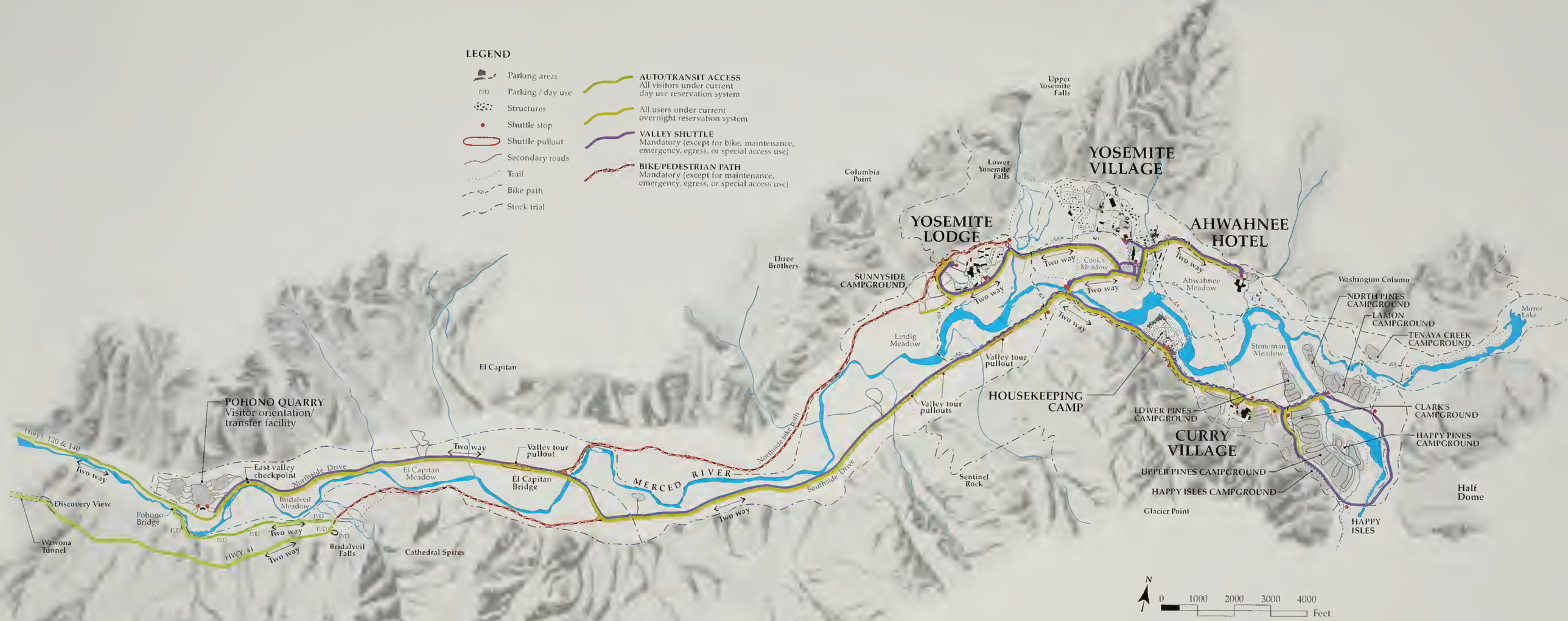


Alternative 2
The Proposed Action
VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA
United States Department of the Interior • National Park Service
DSC/July 1997/104/20,282



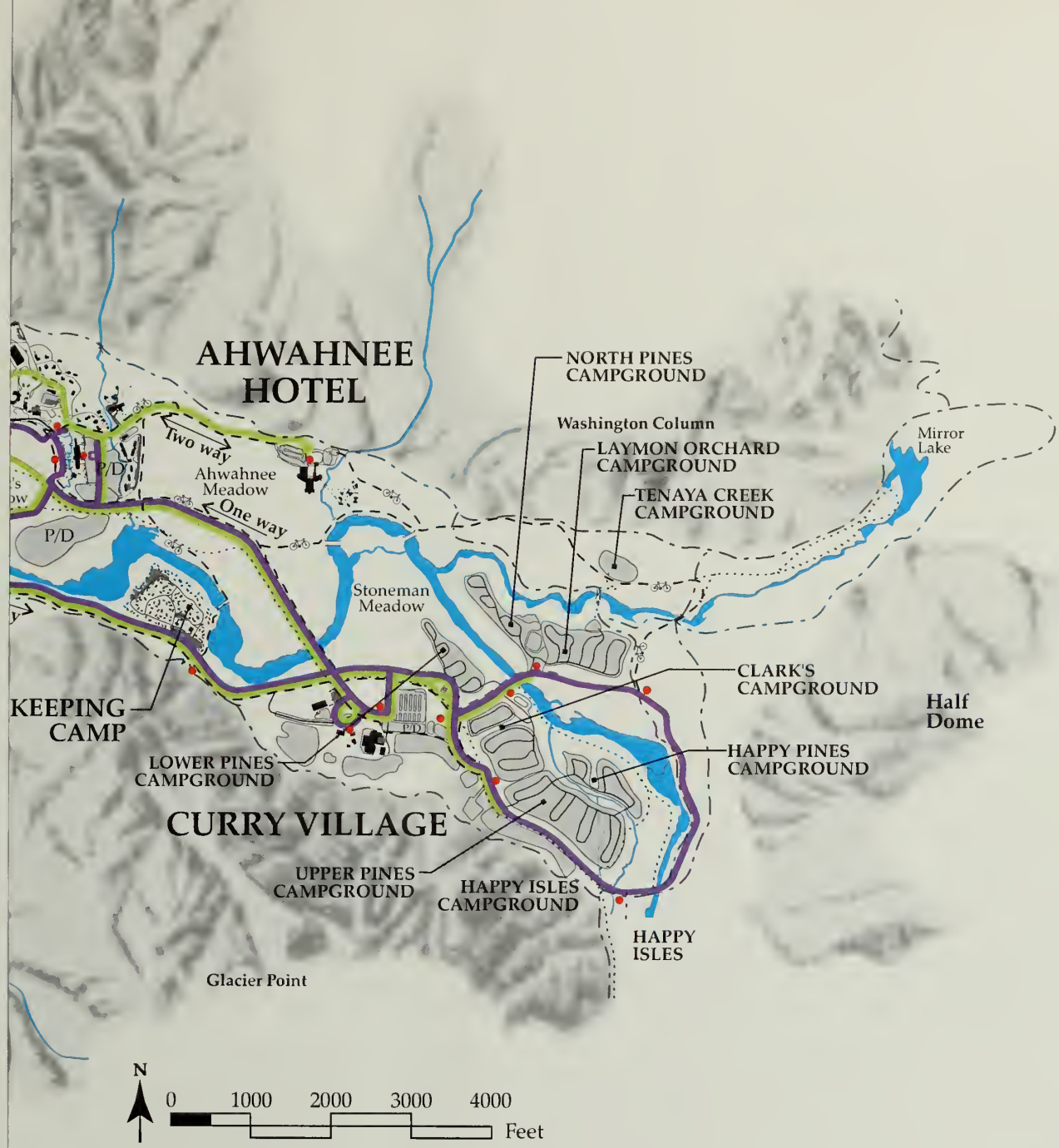
Alternative 3
VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,289



Alternative 3
VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,289



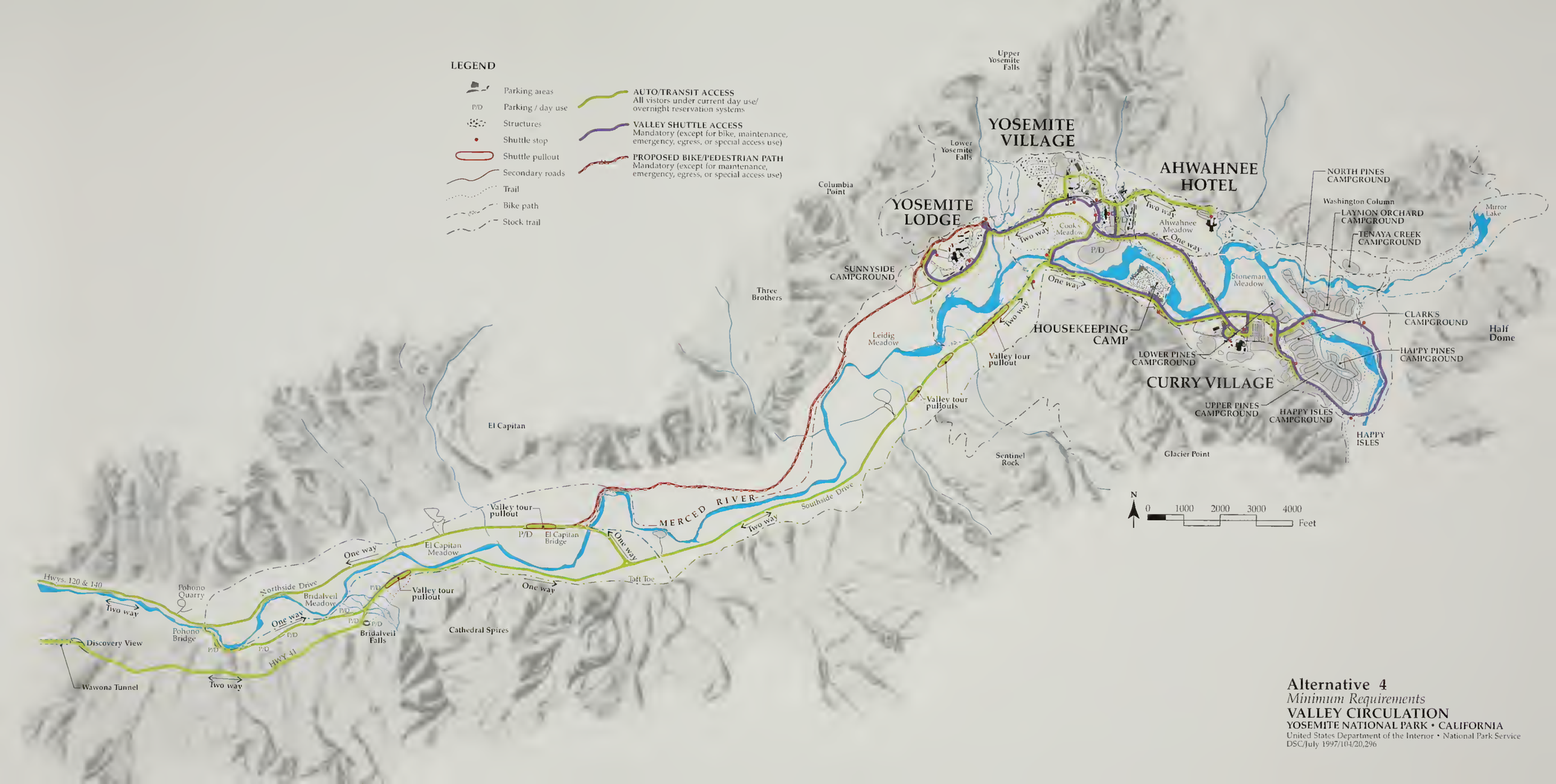
Alternative 4

Minimum Requirements

VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,296



Alternative 4
Minimum Requirements
VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA
United States Department of the Interior • National Park Service
DSC/July 1997/104/20,296



Alternative 1
No Action
EAST VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,276

YOSEMITE VILLAGE

YOSEMITE CREEK BRIOGE

YOSEMITE LODGE
(areas per DCP proposal)

PROPOSED INDIAN CULTURAL CENTER SITE

Northside Drive
One way

Two way

Cook's Meadow

Sentinel Bridge Road

CAMP SIX

SENTINEL BRIDGE

Yosemite Community Chapel

One way

MERCED RIVER

HOUSEKEEPING CAMP

Ahwahnee Hotel Road
Two way

AHWAHNEE HOTEL

Ahwahnee Meadow

Northside Drive
One way

AHWAHNEE BRIDGE

SUGARPINE BRIDGE

WALK-IN CAMPGROUND

NORTH PINES CAMPGROUND

GROUP CAMPGROUND

To Mirror Lake

TENAYA CREEK

TENAYA CREEK BRIDGE

LOWER PINES CAMPGROUND

RIVERS CAMPGROUND

Stoneman Meadow

STONEMAN BRIDGE

CLARK'S BRIDGE

BOYS TOWN CONCESSIONER HOUSING

UPPER PINES CAMPGROUND

CURRY PAVILION

CURRY VILLAGE

FORMER CURRY DUMP BACKPACKERS' TRAILHEAD PARKING

HAPPY ISLES BRIDGE

HAPPY ISLES

P/D

P

LEGEND

- Structures
- Shuttle stop
- Shuttle pullout
- P — Parking
- P/D — Parking / day use
- Secondary roads
- Trail
- Bike path
- Stock trail

AUTO/TRANSIT ACCESS
All day users under
current day use/overnight reservation systems

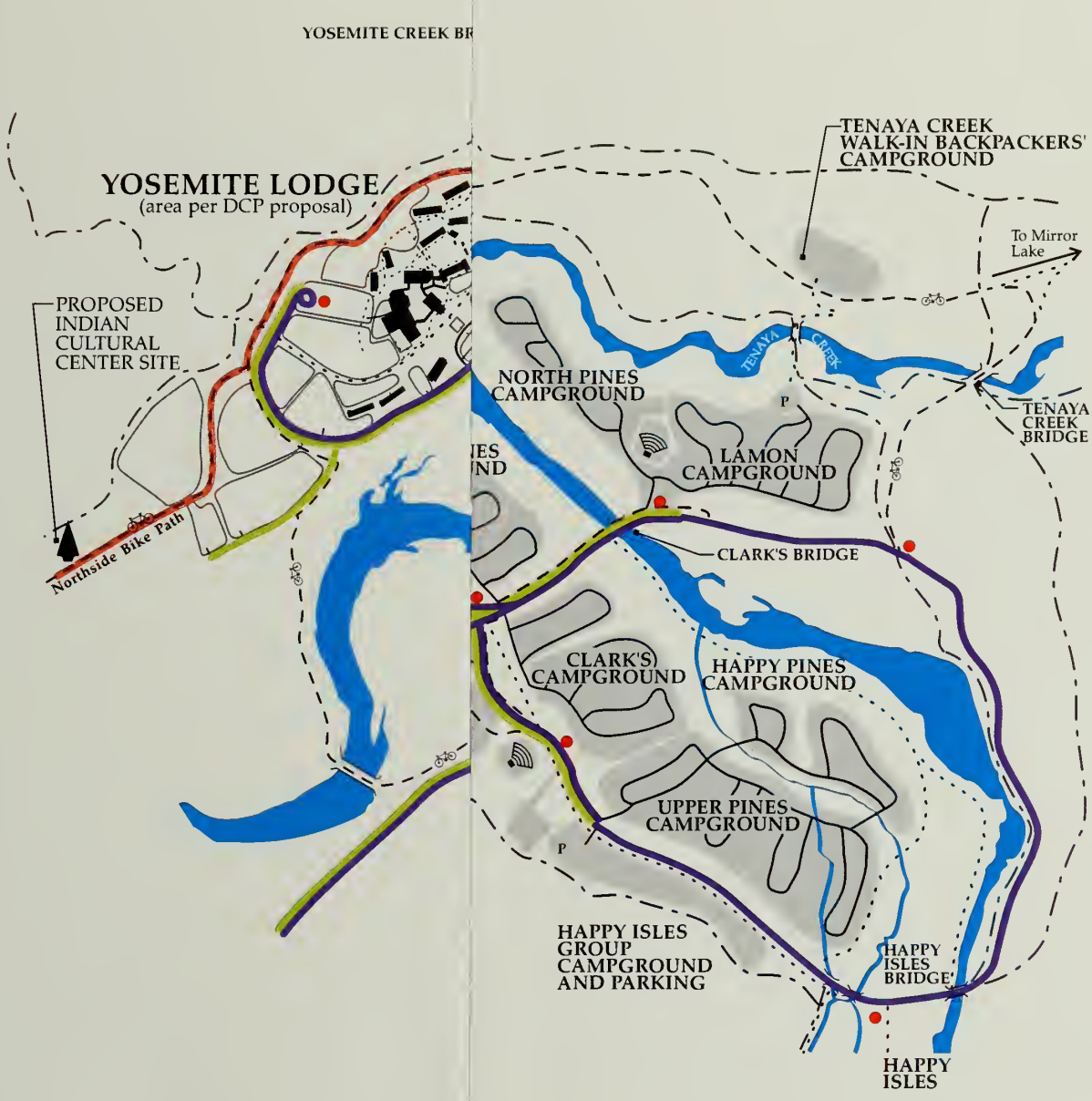
VALLEY SHUTTLE ACCESS
Mandatory (except for bike, maintenance, emergency, egress, or special access use)

BIKES/PEDESTRIAN PATH
Mandatory (except for maintenance, emergency, egress, or special access use)

N
0 250 500 1000
Feet

Alternative 1
No Action
EAST VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,276



Alternative 2

The Proposed Action

EAST VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,283



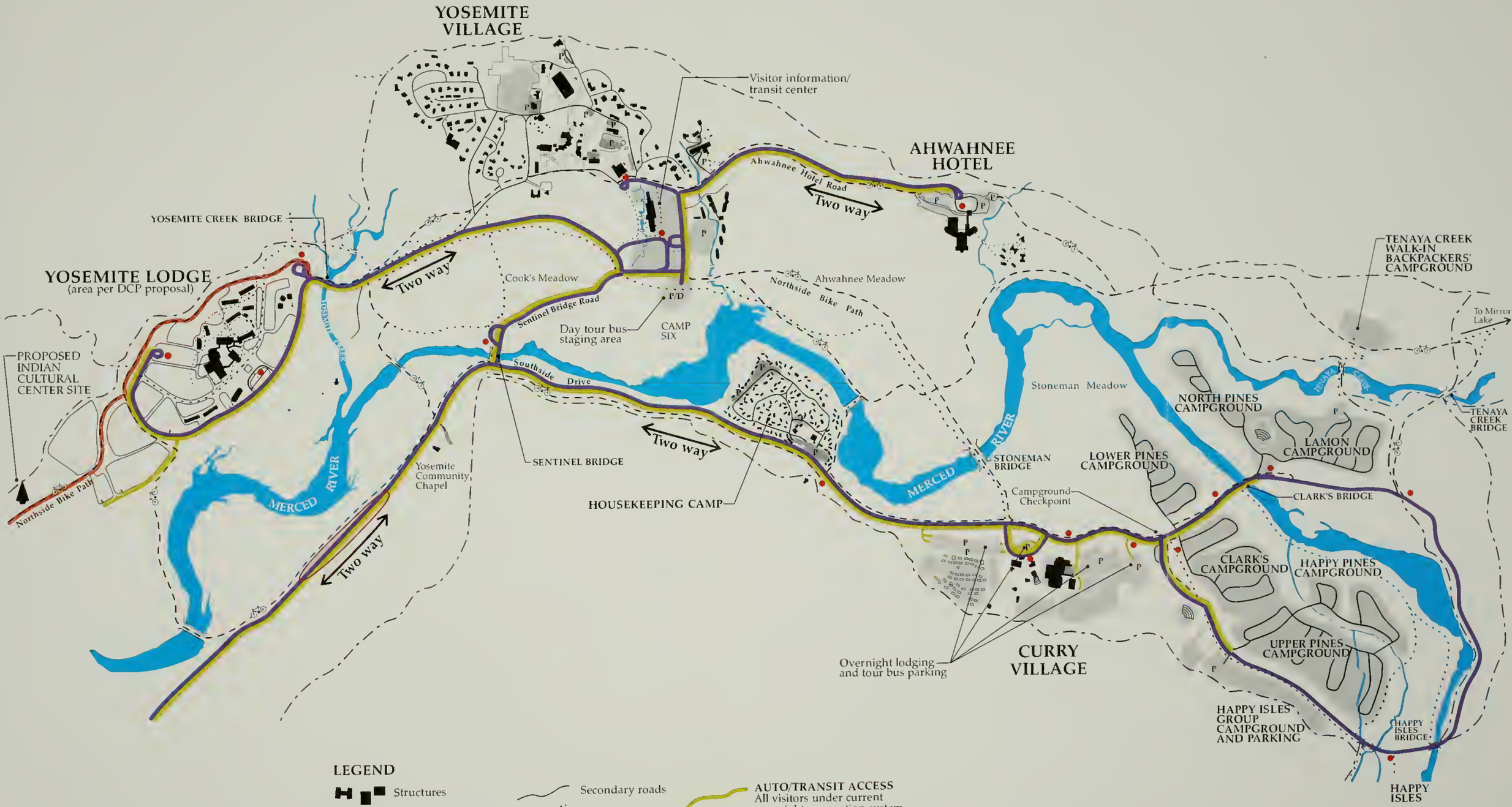
Alternative 2
The Proposed Action
EAST VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,283



Alternative 3
EAST VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,290



Alternative 3
EAST VALLEY CIRCULATION
YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,290



Alternative 4

Minimum Requirements

EAST VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,297

YOSEMITE VILLAGE

VILLAGE STORE, DAY USE VISITOR PARKING, AND ORIENTATION /TRANSIT CENTER

AHWAHNEE HOTEL

Ahwahnee Hotel Road

Two way

AHWAHNEE BRIDGE

SUGARPINE BRIDGE

YOSEMITE CREEK BRIDGE

YOSEMITE LODGE
(area per DCP proposal)

Two way

Cook's Meadow

DAY TOUR BUS STAGING AREA

Ahwahnee Meadow

TENAYA CREEK WALK-IN BACKPACKERS' CAMPGROUND

Sentinel Bridge Road

One way

CAMP SIX

To Mirror Lake

PROPOSED INDIAN CULTURAL CENTER SITE

Southside Drive

One way

Stoneman Meadow

NORTH PINES CAMPGROUND

LAMON CAMPGROUND

TENAYA CREEK BRIDGE

STONEMAN BRIDGE

LOWER PINES CAMPGROUND

CAMPGROUND CHECKPOINT

Northside Bike Path

Yosemite Community Chapel

SENTINEL BRIDGE

MERCED RIVER

CLARK'S BRIDGE

HOUSEKEEPING CAMP

CLARK'S CAMPGROUND

HAPPY PINES CAMPGROUND

PARKING FOR LODGING AND OVERNIGHT TOUR BUSES

CURRY VILLAGE

UPPER PINES CAMPGROUND

HAPPY ISLES GROUP CAMPGROUND AND PARKING

HAPPY ISLES BRIDGE

HAPPY ISLES

Two way

LEGEND

- Structures
- Changed structures
- Shuttle stop
- Shuttle pullout
- P — Parking
- P/D — Parking / day use
- Secondary roads
- Trail
- Bike path
- Stock trail
- **AUTO/TRANSIT ACCESS** — All visitors under current day use/ overnight reservation systems
- **VALLEY SHUTTLE ACCESS** — Mandatory (except for bike, maintenance, emergency, egress, or special access use)
- **BIKE/PEDESTRIAN PATH** — Mandatory (except for maintence, emergency, egress, or special addess use)

N

0 250 500 1000 Feet

Alternative 4

Minimum Requirements

EAST VALLEY CIRCULATION

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
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JANUARY 1997 FLOOD

Limits/Extents

VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/July 1997/104/20,298



JANUARY 1997 FLOOD

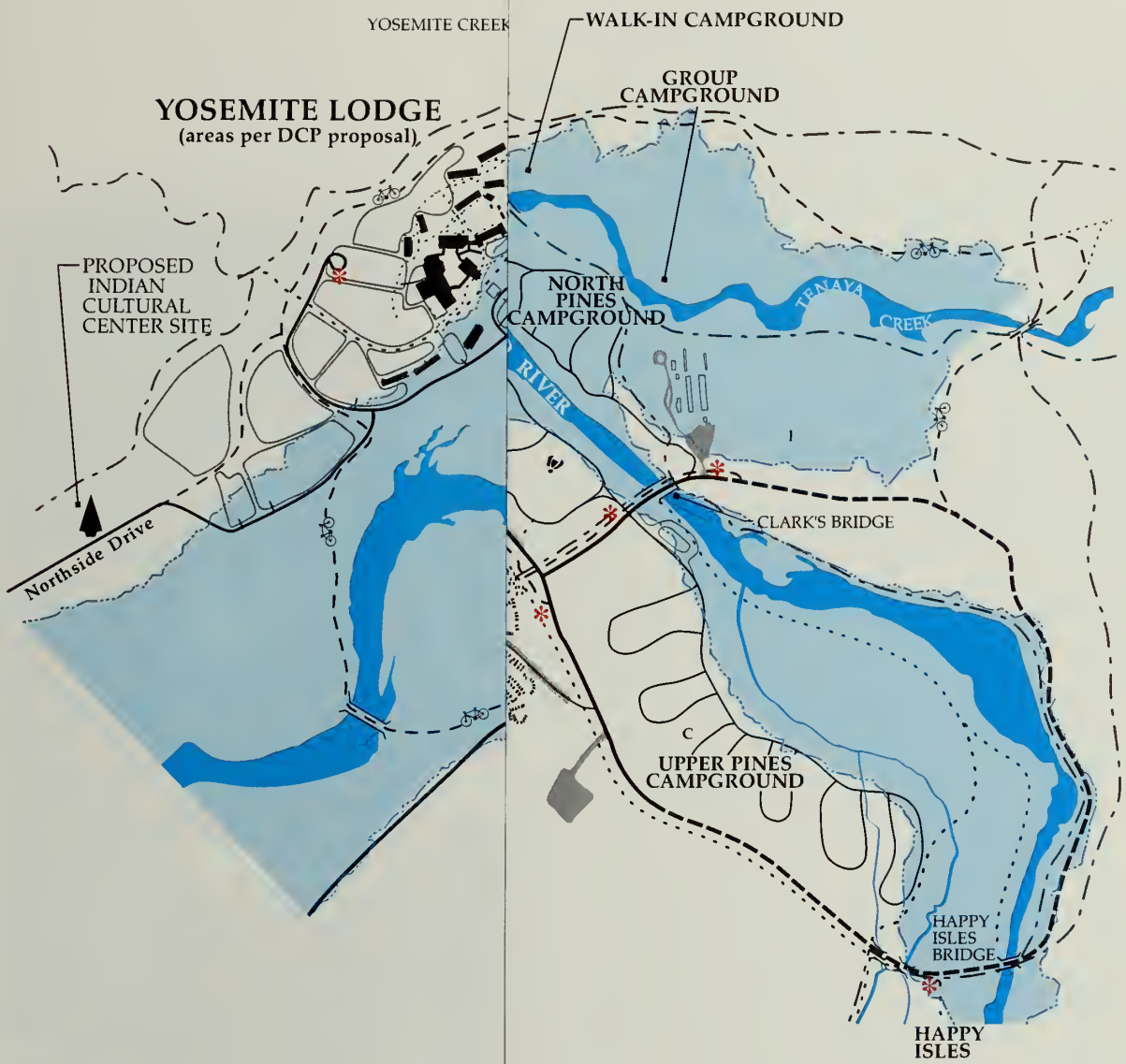
Limits/Extents

VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service

DSC/July 1997/104/20,298



JANUARY 1997 FLOOD

Limits/Extents

EAST VALLEY OVERVIEW

YOSEMITE NATIONAL PARK • CALIFORNIA

United States Department of the Interior • National Park Service
DSC/June 1997/104/20,299

YOSEMITE VILLAGE

AHWAHNEE HOTEL

YOSEMITE LODGE
(areas per DCP proposal)

PROPOSED INDIAN CULTURAL CENTER SITE

YOSEMITE CREEK BRIDGE

Cook's Meadow

Ahwahnee Hotel Road

Ahwahnee Meadow

AHWAHNEE BRIDGE

SUGARPINE BRIDGE

WALK-IN CAMPGROUND

GROUP CAMPGROUND

Sentinel Bridge Road

Northside Drive

YOSEMITE CREEK

CAMP SIX

MERCED RIVER

RIVER CAMPGROUNDS

LOWER PINES CAMPGROUND

NORTH PINES CAMPGROUND

TENAYA CREEK

SENTINEL BRIDGE

Stoneman Meadow

HOUSEKEEPING CAMP

Southside Drive

STONEMAN BRIDGE

CLARK'S BRIDGE

Northside Drive

Southside Drive

CURRY VILLAGE

UPPER PINES CAMPGROUND

HAPPY ISLES BRIDGE

HAPPY ISLES

LEGEND

- January 1997 extent of valley east end flooding
- Parking areas
- Unchanged structures
- Shuttle stop
- Shuttle pullout
- Primary roads
- Secondary roads
- Shuttle bus / bike path
- Trail
- Bike path
- Stock trail

N

0 250 500 1000 Feet

JANUARY 1997 FLOOD

Limits/Extents

EAST VALLEY OVERVIEW

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APPENDIXES, BIBLIOGRAPHY, INDEX

GROSS CONSTRUCTION ESTIMATES (1997 DOLLARS), ALTERNATIVE 1 — NO ACTION

Valley Area / Facility	NPS Gross Construction Costs	Advance Planning and Project Design Costs	Total NPS Costs	Concession Gross Construction Costs	Advance Planning and Project Design Costs	Total Concession Costs
Yosemite Village	$20,270,000	$3,868,000	$24,138,000	$14,980,000	$2,859,000	$17,839,000
Curry Village	1,401,000	267,000	1,668,000	10,657,000	2,034,000	12,691,000
Ahwahnee Hotel	946,000	181,000	1,127,000	103,000	20,000	123,000
Campgrounds	5,694,000	1,087,000	6,781,000			
Valley General	1,641,000	313,000	1,954,000			
Subtotal	**$29,952,000**	**$5,716,000**	**$35,668,000**	**$25,740,000**	**$4,913,000**	**$30,653,000**
Total — Alternative 1						**$66,321,000**

The above estimates are based on fiscal year 1997 construction dollars. For future construction years, the estimates should be increased by 4% per year for inflation. The estimates do not include costs related to reconstruction of concession lodging and housing at Yosemite Lodge, which is covered under the Flood Recovery Emergency Fund; Yosemite Lodge redevelopment costs and some flood recovery activities are outlined in the *Yosemite Lodge Development Concept Plan / Environmental Assessment.*

GROSS CONSTRUCTION ESTIMATES (1997 DOLLARS), ALTERNATIVE 2 — PROPOSED ACTION

Valley Area / Facility	NPS Gross Construction Costs	Advance Planning and Project Design Costs	Total NPS Costs	Concession Gross Construction Costs	Advance Planning and Project Design Costs	Total Concession Costs
Orientation / Transit Center	$18,844,000	$3,596,000	$22,440,000	$1,802,000	$344,000	$2,146,000
Yosemite Village	32,468,000	6,196,000	38,665,000	15,847,000	3,024,000	18,871,000
Curry Village	3,029,000	578,000	3,607,000	19,224,000	3,669,000	22,893,000
Ahwahnee Hotel	946,000	181,000	1,127,000	103,000	20,000	123,000
Campgrounds	20,548,000	3,921,000	24,468,000			
Valley General	6,165,000	1,177,000	7,342,000			
Subtotal	**$82,000,000**	**$15,649,000**	**$97,649,000**	**$36,976,000**	**$7,057,000**	**$44,033,000**
Total — Alternative 2						**$141,682,000**

The above estimates are based on fiscal year 1997 construction dollars. For future construction years, the estimates should be increased by 4% per year for inflation. The estimates do not include costs related to reconstruction of concession lodging and housing at Yosemite Lodge, which is covered under the Flood Recovery Emergency Fund; Yosemite Lodge redevelopment costs and some flood recovery activities are outlined in the *Yosemite Lodge Development Concept Plan / Environmental Assessment.*

GROSS CONSTRUCTION ESTIMATES (1997 DOLLARS), ALTERNATIVE 3

Valley Area / Facility	NPS Gross Construction Costs	Advance Planning and Project Design Costs	Total NPS Costs	Concession Gross Construction Costs	Advance Planning and Project Design Costs	Total Concession Costs
Orientation / Transit Center	$131,357,000	$25,068,000	$156,425,000	$1,537,000	$293,000	$1,830,000
Yosemite Village	29,363,000	5,604,000	34,967,000	18,279,000	3,489,000	21,768,000
Curry Village	3,403,000	649,000	4,052,000	17,271,000	3,296,000	20,567,000
Ahwahnee Hotel	958,000	183,000	1,141,000	103,000	20,000	123,000
Campgrounds	20,548,000	3,921,000	24,469,000			
Valley General	4,954,000	945,000	5,899,000			
Subtotal	**$190,583,000**	**$36,370,000**	**$226,953,000**	**$37,190,000**	**$7,098,000**	**$44,288,000**
Total — Alternative 3						**$271,241,000**

The above estimates are based on fiscal year 1997 construction dollars. For future construction years, the estimates should be increased by 4% per year for inflation. The estimates do not include costs related to reconstruction of concession lodging and housing at Yosemite Lodge, which is covered under the Flood Recovery Emergency Fund; Yosemite Lodge redevelopment costs and some flood recovery activities are outlined in the *Yosemite Lodge Development Concept Plan / Environmental Assessment.*

GROSS CONSTRUCTION ESTIMATES (1997 DOLLARS), ALTERNATIVE 4 — MINIMUM REQUIREMENTS

Valley Area / Facility	NPS Gross Construction Costs	Advance Planning and Project Design Costs	Total NPS Costs	Concession Gross Construction Costs	Advance Planning and Project Design Costs	Total Concession Costs
Yosemite Village	$25,175,000	$4,804,000	$29,979,000	$17,500,000	$5,248,000	$22,748,000
Curry Village	1,096,000	209,000	1,305,000	16,063,000	3,065,000	19,128,000
Ahwahnee Hotel	958,000	183,000	1,141,000	103,000	20,000	123,000
Campgrounds	18,686,000	3,566,000	22,252,000			
Valley General	1,660,000	317,000	1,977,000			
Subtotal	**$47,575,000**	**$9,079,000**	**$56,654,000**	**$33,666,000**	**$8,333,000**	**$41,999,000**
Total — Alternative 4						**$98,653,000**

The above estimates are based on fiscal year 1997 construction dollars. For future construction years, the estimates should be increased by 4% per year for inflation. The estimates do not include costs related to reconstruction of concession lodging and housing at Yosemite Lodge, which is covered under the Flood Recovery Emergency Fund; Yosemite Lodge redevelopment costs and some flood recovery activities are outlined in the *Yosemite Lodge Development Concept Plan / Environmental Assessment.*

APPENDIX B: VISITOR POPULATION ESTIMATES

There are two principal sources of data on visitation patterns: survey information collected and analyzed by James H. Gramann at Texas A&M University and the park visitation statistics published by the National Park Service in monthly public use reports.

To develop the visitor population category estimates, these two sources were analyzed and the results from a 1993 exit survey conducted by BRW, Inc., were reviewed. The following section provides a description of the methods and calculations used in our analysis of these data sources.

In method 1, we utilized the visitation and length of stay information provided in *Alternative Futures and Recreational Displacement at Yosemite National Park* (Gramann 1992). In method 2, we used park visitation data from the 1994 monthly public use reports generated by the National Park Service. In method 3, we reviewed data from a park visitor exit survey conducted by BRW in 1993.

In developing the distribution of park visitors, our primary concern was to distinguish wholly separate visitor categories; for example, to eliminate any overlap among visitors spending the night both inside and outside the park. Our second primary concern was to include in the local overnighter category only those visitors spending the night in the affected region; visitors spending the night outside of the affected region are classified as day excursion visitors.

Of the data sources considered, we selected the visitor distribution as derived from the Gramann report because it was the only source that enabled us to develop three separate visitor category estimations and maintain the local overnighter category for only those spending the night in the affected region. Both the monthly public use report and the BRW survey allowed for a breakdown between park overnighters and day users. We used data from the Gramann report to distinguish between local overnighters and day excursion visitors when analyzing the monthly public use reports in method 2.

The distribution of visitor days is a measure of the relative impacts of each group's visitation on the park and the affected region. In particular, we expect a park overnighter who stays in the park for 2.7 days to have a larger spending impact than a day excursion visitor who is in the park for 4.2 hours. This is captured by the distribution of visitor days such that park overnighters account for 65.0% of visitor days, while day excursion visitors, who account for nearly one-third of total park visitors, only account for 5.7% of visitor days.

The following sections discuss our methodology in developing the distribution of visitors and the distribution of visitor days from the three sources.

Method 1

In the first method, we developed park overnight, local overnight, and day excursion visitor estimates by adjusting length of stay information from the Gramann report to (1) account for the overlap between park overnighters and local overnighters and (2) narrow the local overnight category to only include overnight stays in the affected region.

According to the Gramann report 55.3% of auto passenger visitors spent at least one night in Yosemite, 51.2% spent at least one night outside Yosemite, and 34.5% spent at least on night outside the park, but did not stay in Yosemite (Gramann 1992). According to our calculations, 16.7% (51.2%–34.5%) of auto passengers spent the night both inside and outside of the park. Approximately 38.6% (55.3%–16.7%) spent the night only inside the park (park overnighters), and 10.2% did not spend the night in the park or outside of the park (day excursion visitors). Therefore, park overnighters account for 38.6% of park visitors, local overnighters account for 34.5%, the overlapping group of park overnighters and local overnighters account for 16.7%, and day excursion visitors account for 10.2%.

In order to develop distinct visitor population categories, we first needed to distribute the auto passenger visitors who both spend the night inside the park and outside the park into separate categories: park overnighters and local overnighters. We distributed these visitors based on their average lengths of stay. The average length of stay for auto passengers spending the night in the park is 2.7 nights. The average length of stay for auto passengers spending the night outside of the park is 4.8 nights. This includes destinations well outside of the affected region, such as the Grand Canyon and San Francisco (Gramann 1992). We therefore substituted the length of stay for auto passengers staying in the park (2.7

nights) as a proxy for the length of stay of auto passengers spending the night outside of the park. Given that the average length of stay for both groups is assumed to be 2.7 nights, we distributed the visitors who both spend the night inside and outside the park such that 50% were allotted to the park overnighter category and 50% to the local overnighter category. As a result, park overnighters account for 47.0% of visitors, local overnighters for 42.8% of visitors, and day excursion visitors for 10.2% of visitors.

Our second step in developing distinct visitor population categories was to identify those visitors classified as local overnighters who spent the night outside the affected region and account for them as day excursion visitors. We determined that of those visitors staying in communities outside of the park, 49.5% stayed in communities in the affected region and 50.5% stayed in communities outside the affected region (Gramann 1992). Based on this redistribution of local overnighters and day excursion visitors, our final estimate of the distribution of park visitors are that approximately 47.0% of visitors are park overnighters, 21.2% are local overnighters, and 31.8% are day excursion visitors.

We adjusted the park visitor distribution to reflect the proportion of annual visitation associated with each visitor group based upon their respective lengths of stay in the park. Again, we assumed an average length of stay of 2.7 days for park overnighters and local overnighters, and for day excursion visitors we assumed a length of stay of 4.2 hours (Gramann 1992). Based on these estimates, we calculated that park overnighters account for 65.0% of visitor days in Yosemite, local overnighters account for 29.3%, and day excursion visitors account for 5.7% of visitor days.

We also analyzed Gramann's survey results directly to determine if we could generate more specific results through direct use of the data set. We cleaned the data to remove outliers and sorted the data set to separately account for those visitors who spent the night in the park, outside of the park, and did not spend the night in the region. We calculated the number of visitor days reported by the different groups. For those visitors reporting that they had spent less than one day, we converted their trip length estimates from hours into days assuming that 12 hours equals one day. From the Gramann data set, we determined that park overnight visitors accounted for 49%, local overnighters accounted for 42%, and day excursion visitors accounted for 9% of reported park visitor days.

In our separate analysis of the data set, we were not able to distinguish between local overnighters that lodged in the affected region from those that lodged outside of the affected region. Thus, in the impact analysis, we used the visitor proportions developed from the Gramann report.

Method 2

In the second method, we used data from the monthly public use reports produced by the National Park Service to estimate the proportion of park visitors that are park overnighters and day users (including both local overnighters and day excursion visitors). We then distinguished between local overnighters and day excursion visitors using our estimates from the Gramann report. Finally, we developed estimates of park visitation for the three visitor groups based upon their respective lengths of stay. From the monthly public use reports, we determined that 27.4% of visitors to the Yosemite are park overnighters, 29.1% are local overnighters, and

43.6% are day excursion visitors. Based on length of stay data used by the Park Service in the reports, we calculated that park overnighters account for 43.5% of total visitor days to the park, local overnighters account for 46.2% of total visitor days, and day excursion visitors account for 10.3% of total visitor days.

From the monthly public use reports, we know that approximately 4.106 million people visited the park in 1994, including both recreational and nonrecreational visitors. These park visitors spent a total of 86.401 million visitor hours in the park, which translates into 7.201 million visitor days.

In 1994 there were 2.248 million overnight stays. Total overnight stays is a "pillow count" of the occupancy of park lodging. Thus, one individual staying 2 nights would be counted as two overnight stays. According to the Park Service, the average length of stay for overnight visitors to the park is 28 hours or 2.3 days (12 hours is equivalent to one day). We converted total overnight stays into total overnight visitors by dividing overnight stays by the average length of stay of 2 nights, resulting in an estimate of total overnight visitors of 1.124 million visitors. This represents 27.4% of total visitors to the park in 1994.

We assumed that day users represent the remaining 72.6% of visitors to the park. The monthly public use

reports did not provide information with which to distinguish between local overnighter and day excursion visitors. We imported from our analysis of the Gramann report that 40% of day users are local overnighters and 60% are day excursion visitors. From this relationship, we determined that 27.4% of park visitors are park overnighters, 29.1% are local overnighters, and 43.6% are day excursion visitors.

In 1994 the total number of visitors was 4.106 million visitors and the total number of visitor days was 7.201 million visitor days. The average length of stay for all visitors according to these two figures was 1.75 visitor days. The weighted average length of stay from the proportion of park overnighters (27.4%), local overnighters (29.1%), and day excursion visitors (43.6%) and their respective lengths of stay of 2.3 days, 2.3 days and 5 hours, was not equivalent to the average length of stay calculated from the total visitor and visitor day figures (1.75 visitor days). To rectify this, we decided to maintain the integrity of the overall relationship between total visitors and total visitor days as reported by the park and adjust the lengths of stay for the visitor groups. We assumed that the average length of stay for park overnighters and local overnighters are roughly equivalent and solved simultaneous equations to determine lengths of stay. We assumed that the average length of stay for day excursion visitors is 5.0 hours, as reported by the Park Service and calculated an average length of stay of 2.79 nights for park overnighters and local overnighters. This length of stay estimation was close to the average length of stay from the Gramann report (2.7 nights), which increased our confidence in the figures.

We then calculated the relative proportions of total visitor days with which each of the three visitor categories were associated. We estimated that of the 7.201 million visitor days in 1994, park overnighters accounted for 43.5%, local overnighters for 46.2% and day excursion visitors for 10.3%.

Method 3

In 1993 visitor exit survey, BRW estimated that 44% of peak season visitors spend at least one night inside the park, and 56% are day users. In *Alternative Transportation Modes Feasibility Study Volume IV: Yosemite National Park*, BRW estimates that of total visitors to the park, 17% spend the night within one day's drive of the park and 39% do not spend the night in the park or within one day's drive of the park (BRW 1994). On further clarification, BRW stated that this breakdown was based on informal information obtained from the Park Service and could not be further substantiated. BRW indicated that they were confident of their results in the breakdown between overnight visitors and day users to the park; however, distinguishing between local overnighters and day excursion visitors could not be substantiated. Thus according to the BRW survey, we note that 44% of visitors are park overnighters and 56% of visitors to Yosemite are day users. The breakdown between park overnighters and day users compares favorably with the results from the Gramann report.

There was not sufficient data from the BRW survey to develop visitation estimates for the visitor groups.

The distribution of visitors and the distribution of visitor days was supported by the Gramann report in our impact analysis. We selected the figures derived from the Gramann report because it was our sole source for distinguishing between local overnighters and day excursion visitors, and also allowed for identification of visitors staying within the affected region. From the Gramann report, we determined that park overnighters account for 47.0% of visitors, local overnighters for 21.2% and day excursion visitors for 31.8%. The breakdown between park overnighters and day users from the Gramann report was supported by a similar breakdown from the BRW survey.

Also from the Gramann report, we determined that the relative distribution of visitor days among the park visitor categories are: park overnighters account for 65.0% of visitor days, local overnighters account for 29.3%, and day excursion visitors account for 5.7%. The distribution of visitor days is used in the impact section to distribute the relative impacts of visitor spending among the three visitor categories.

APPENDIX C: LENGTH OF STAY ESTIMATES

In developing length of stay estimates we sought to (1) develop estimates specific to Yosemite visitors, (2) distinguish between the different visiting populations, (3) develop length of stay estimates compatible with the defined affected region, and (4) account for seasonal differences in length of stay. The Gramann report was the primary source that provided information addressing all of these parameters.

We selected the average length of stay estimates from the Gramann report of 2.7 nights for park overnighters and local overnighters and 4.2 hours for day excursion visitors. These estimates are used in our analysis of the visitor population breakdown and the visitation impacts associated with each visitor group. We chose the Gramann figures because they are specific to the Yosemite visiting population, allow for distinctions between visitors staying overnight and just for the day, and are compatible with the defined affected region.

In addition to the length of stay estimates provided by the Gramann report, we considered several data sources when analyzing the average length of stay of Yosemite visitors. These include our estimates derived through direct analysis of the Gramann data, as well as length of stay estimates developed by BRW, Kaplan, the National Park Service, Dean Runyan, and Shifflet. We review the data provided by these sources below:

Our direct statistical analysis of the Gramann data yielded length of stay estimates of 2.8 nights for park overnighters, 5.7 nights for local overnighters, and 1 day for day excursion visitors. Our results are different from Gramann's because we (1) sorted the data to remove incomplete responses, and (2) removed outliers from the data set. We regarded our estimates generated from the data with some caution, especially our estimated length of stay for local overnighters, which included, for example, a reported length of stay of 98 days. It is likely that this group traveled to other destinations, as it is difficult to believe that group spent over 3 months visiting Yosemite. We decided not to use our analysis of the Gramann data because we were not able to determine lengths of stay just for time spent in the park or in the affected region, and we were not able to distinguish between peak and off-peak season trip lengths.

BRW estimated an average length of stay of 2.7 nights for persons lodging in the park in hotels, campgrounds, and the backcountry (BRW 1994). This is equivalent to the average annual length of stay reported by Gramann. However, BRW did not provide an estimate for the number of hours spent in the park by the typical day user. Additionally, the BRW figures did not provide length of stay estimates for peak versus off-peak visitors.

The survey results compiled by Kaplan indicated an average length of stay of 2.3 nights for visitors lodging in motels and lodges in the gateway communities to the park. However, we do not believe this estimate to be an accurate representation of local overnighters' length of stay for several reasons. First, this length of stay estimate includes nights spent in the park for some visitors and is therefore not strictly an estimate for time spent lodging outside of the park. Unfortunately, we were not able to separate lodging time spent outside of park from time spent inside the park. According to our estimates from the survey data, 7.3 % of respondents spent the night in the park prior to being surveyed, and 9.5 % would be spending the night in the park later.

The second drawback associated with the Kaplan data is that it probably underestimates the trip lengths reported by the surveyed visitors. In some cases, survey responses on length of stay were reported in ranges, for example for "5 or more nights." Instead, we used a conservative estimate of 6 nights as the average response to trip lengths of "5 or more nights." In doing this, however, we cut off the high end of the data set (e.g. those visitors that may be staying 98 nights) and probably underestimated the reported trip lengths.

The third drawback associated with using the Kaplan data to estimate an average length of stay for local overnighters is that it does not include campers. Omitting campers probably underestimates the length of stay because camping parties typically spend more nights than hotel users.

The National Park Service developed average lengths of stay for use in compiling the monthly public use reports. The Park Service assumed an average length of stay of 5.0 hours for recreational visitors and 28.0 hours (2.3 days, using the Park Service conversion of 1 day equals 12 hours) (NPS 1994). We used these figures, to some degree, when analyzing visitor distributions using the monthly public use reports.

Dean Runyan estimated an average length of stay of 12.1 nights for national park campers in the state of California. The average length of stay for campers in public campgrounds is 7.1 nights, for campers in commercial campgrounds, 11.3 nights, and for all campgrounds in California, 7.8 nights (Dean Runyan 1994). These estimates are useful for illustrating that camping groups on average take longer trips than hotel/motel lodging groups; however, they are not directly applicable to the Yosemite visiting population.

Shifflet estimated the average length of stay for travelers in California for 1994, 1993, and 1992. On average, California residents took shorter trips than non California residents traveling in California. In 1993 and 1992, California nonresidents' trip length to California tended to be longer than the average leisure visit in the U.S. As can be seen in 1993, however, the average trip length in California is comparable to the average U.S. leisure visit.

This range of trip lengths from Shifflet is useful for putting trip lengths specific to Yosemite National Park visitors into context. However, because they apply to a wide array of trip locations, including urban centers such as San Francisco and Los Angeles, these trip lengths are not as applicable as the data that directly relates to Yosemite visitors.

In conclusion, we used the average annual length of stay estimates from the Gramann report of 2.7 nights for park overnighters and local overnighters and 4.2 hours for day excursion visitors. We selected the estimates from the Gramann report because the figures are specific to the Yosemite visiting population, allow for distinctions between visitors staying overnight and just for the day, and are compatible with the defined affected region. The only drawback associated with using these figures is that we are not separately accounting for trip lengths of local overnighters.

Our review of other sources increases our confidence in the Gramann estimates through corroboration of the Gramann figures, as in the case of the BRW data, and through providing a range such that we are certain that the Gramann estimates are reasonable.

APPENDIX D: SUMMARY OF THE TRANSPORTATION STUDY

PURPOSE

Section 1050 of the Intermodel Surface Transportation Efficiency Act of 1991 (Public Law 102–240) requested that a study be conducted of alternatives for visitor transportation in the national park system. Because of congressional intent and interest, the study used Denali National Park and Preserve and Yellowstone and Yosemite National Parks as case studies. Each of these park units has special transportation problems.

The studies included an evaluation of specific alternatives to private vehicle travel in each of the three parks and a comprehensive inventory of transportation technologies that could serve visitor transportation needs in the national park system.

The information presented in the Yosemite study was intended for use in the conceptional development and evaluation of transportation alternatives in Yosemite National Park. It provided a preliminary assessment of the feasibility of visitor transportation system operations in the park. The study was not intended to produce a recommended alternative for visitor transportation.

EXCERPTS FROM THE EXECUTIVE SUMMARY

Introduction

Transportation to and in the park has been a source of conflict and controversy over most of Yosemite's history. Automobiles were banned from the park between 1907 and 1913. After 67 years of private vehicle access and in response to the undesirable impacts associated with growth in traffic volumes and increasing demand for parking, the 1980 *Yosemite General Management Plan* stated: "Increasing automobile traffic is the single greatest threat to enjoyment of the natural and scenic qualities of Yosemite. . . . The ultimate goal of the National Park Service is to remove all private vehicles from Yosemite Valley. The Valley must be freed from the noise, the smell, the glare and the environmental degradation caused by thousands of vehicles."

Several planning efforts have suggested ways to reduce the influence of private vehicles in Yosemite Valley since the *General Management Plan* was written 13 years ago. Meanwhile, two other areas of the park have experienced substantial increases in visitation, resulting in congested conditions and an increasingly urban character of visitor experience.

Now visitor transportation systems are operated by the Yosemite concessioner under the management of the National Park Service in Yosemite Valley, the Mariposa Grove/Wawona area, and Tuolumne Meadows.

These systems have helped meet visitor transportation needs in these areas, but increasing delays from traffic and inadequate parking for access to the transportation systems have limited their effectiveness. This study examined opportunities to improve visitor transportation system (VTS) service in each of these major activity areas. The study also evaluated alternative strategies to intercept private vehicles bound for Yosemite Valley at remote locations in the park and outside park boundaries.

Visitation

Visitation to Yosemite has increased steadily since 1981. Nearly all of the recent growth in visitation is associated with increasing day use. In 1981 day users accounted for 15% of all park visitation. By 1991 37% of visitors were making day trips in and out of the park. The *Concession Services Plan* and the *General Management Plan* call for a reduction in overnight lodging and camping facilities in the park. Since overnight lodging and camping accommodations are nearly fully occupied year-round, day use trips will continue to account for nearly all of the growth.

The *General Management Plan* established maximum daily visitation levels for each of the activity areas in the park. Limits based on the estimated carrying capacity of visitor facilities were defined for day use and overnight visitation. These visitation limits were used to define the peak requirements for the VTS alternatives evaluated in this study. On the busiest summer weekends, traffic counts and parking occupancy studies conducted in 1992 indicated that visitation at Yosemite had reached the prescribed limits. Future growth in visitation will result from increases in off-peak attendance.

The travel patterns of visitors in Yosemite have a significant influence on the viability of VTS alternatives. Over 60% of visitors travel to Yosemite as part of a larger vacation itinerary. Many of these visitors enter the park at one location and leave at another. Visitor surveys indicate that 70% of all Yosemite visitors travel to Yosemite Valley for a portion of their stay in the park. More in-depth data on the travel patterns of visitors was collected over a 6-day period from August 12 through August 17, 1993, which included weekdays and weekend days. From this data it was determined that 57% of all visitors enter and leave the park via different entrance stations and that 50% of all visitors to Yosemite Valley also travel to one of the major activity areas in the park. Only 21% of the Yosemite Valley visitors contacted during the survey period visited only the valley and entered and exited through the same entrance station. Figure shows the overall visitation patterns of Yosemite visitors.

Transportation in Yosemite and in the Valley

On an average summer day in 1992, 6,500 to 7,000 vehicles entered the park. The south entrance station accommodated the most entries, with 27% of the 1992 peak season traffic. Arch Rock entrance, on the west, accounted for 24%, as did the north entrance at Big Oak Flat. The Tioga Pass entrance, serving travelers from the east, was only slightly behind the others at 22%. The Hetch Hetchy entrance, which does not provide access to the rest of the park, accounted for the remaining 2%. Tour buses are the fastest growing mode of travel. Tour bus access to Yosemite was first allowed in 1977, and by 1983 there were 3,021 tour bus trips. In 1992 there were 13,313 bus tours — an increase of 1,144 trips per year or an average annual growth rate of 17.9%. Tour bus travel can be expected to continue increasing, driven by aging of the population, increased visitation by foreign travelers, and increased emphasis on alternative transportation modes.

The highest traffic volumes in the park are in Yosemite Valley. In July 1992 the average one-way daily traffic volume on Northside Drive leading out of the valley was 6,300 vehicles. On holiday weekends during the peak summer season hourly volumes entering the park approached 1,100 vehicles.

Traffic volumes on holiday weekends exceed the capacity of the Valley Loop road. Congestion is a reoccurring problem at the village intersection on Northside Drive. A traffic management strategy that diverted vehicles bound for the valley at El Captain crossover was implemented on three to four days before 1993. A more restrictive traffic management strategy was used on some weekends in 1993. Visitors are turned away at the entrance stations during highly congested periods.

Visitor Travel Patterns

The formal parking areas serving the most active visitor facilities are always full. On summer weekends parking overflows the formal areas onto roadsides throughout the east end of the valley, and traffic and pedestrian conflicts are common.

The valley shuttle system, which has operated in some form for over 24 years, provides frequent, free service for visitor and employee trips between destinations in the east end of the valley. An average of 22,600 passengers rode the shuttle system each day in August 1992. Annual ridership in 1991 totaled nearly 3.4 million. The service eliminates a substantial number of vehicle trips that would otherwise be made among the various visitor services and activity areas. However, the location of the primary day use parking area at the far end of the valley results in traffic congestion that significantly affects the speed and reliability of the valley shuttle system. Crowding is a constant problem during peak demand periods, and buses occasionally pass up passengers waiting at stops.

When the reductions in overnight accommodations called for in the *Concession Services Plan* and *General Management Plan* are implemented, approximately 4,000 daily trips will be made into the valley by visitors going to lodging units, campsites, and day use activities. An equal number of outbound trips also will be made. Day use traffic will account for over 77% of these vehicle trips. Reduction or elimination of the day use trips has the potential to eliminate most of the negative impacts associated with private vehicles in the valley.

Transportation Alternatives

Transportation system alternatives were developed to address access and circulation in Yosemite Valley.

The needs of day use visitors, campers, back country users, and lodging guests were considered in the development and evaluation of the alternatives. The improvements considered included relocation and

expansion of parking facilities, reduction of traffic conflicts through facility relocations and roadway improvements, remote staging areas serving activity centers, enhanced VTS bus services, ant the implementation of at-grade and elevated fixed-guideway transit systems.

Opportunities to capitalize on the resource enhancement potential of visitor transportation systems by relocating visitor facilities and realigning transportation corridors out of sensitive areas were also identified.

Criteria were prepared to guide the development of transportation system alternatives, to focus the initial screening of alternatives to a smaller set of feasible options, and to direct the comparison of the feasible alternatives for Yosemite.

Essential Requirements/Criteria. To be considered for detailed evaluation, transportation improvement alternatives for Yosemite were required to have the following essential characteristics:

- be able to accommodate GMP visitation levels in all areas
- allow visitation to be managed to achieve GMP visitation levels
- afford a meaningful reduction in private vehicle travel
- avoid duplicating private vehicle travel patterns due to multiple visitor destinations in the park and travel between entrance stations
- allow current visitor use patterns to continue, including the ability to conveniently visit more than one area of the park in a one-day visit, allow trips through the park to be made by entering and exiting through different gates, and allow visitors to experience a full range of scenic and wilderness-orientated activities
- be compatible with local transportation plans
- reduce vehicle-related emissions
- reduce energy consumption associated with transportation
- maintain visual quality in key areas, especially the pristine view across the west end of the valley from Discovery View and the view into the valley from Glacier Point
- employ proven, available technologies for visitor transportation systems
- comply with the requirements of the Americans with Disabilities Act
- allow unrestricted movement of wildlife across and along the transportation system

Finally, the alternatives had to present cost-effective solutions to transportation problems and resource impact concerns in Yosemite, considering the magnitude of the problems and the level of investment required.

The Alternatives Analysis Considered the Following:

- Should both overnight and day use visitor trips be diverted to a visitor transportation system?
- Should staging areas be located near or in the valley, at remote sites in the park, or at sites outside the park?
- What routes can best serve visitor transportation needs in the valley?
- What technologies are most important for use in the valley environment?

VTS alternatives to serve overnight visitors were considered but not carried forward for detailed evaluation. The following factors led to the decision to plan for overnight visitors to continue to travel to their accommodations in private vehicles:

- Analysis of travel patterns revealed that 77% of the vehicle trips to and from the valley are associated with day use visits (see table D-1).
- Equipment and vehicles to carry baggage and camping gear would be very expensive.
- Visitor resistance to being separated from luggage and equipment was expected.
- There was a potential for loss and/or damage to camping equipment and baggage.

TABLE D-1: YOSEMITE VALLEY DAILY VEHICLE ACCESS AND EGRESS TRIPS BY VISITORS

User Type	Daily Users	% by Bus	Number of Units	Party Size	Vehicle Occupancy	Number of Vehicles	Max. Vehicles in Valley	Length of Stay (Nights)	Daily Vehicle Trips
Day	10,530	15	NA	2.9	2.9	3,086	1,750	0.00	6,172
Hotel	3,679	15	1,215	3.0	3.0	1,033	1,033	2.7	765
Camping	4,032	0.00	765	5.3	2.9	1,390	1,.390	2.7	1,030
Backcountry	145	0.00	145	1.0	2.9	50	50	2.7	40
Total	**18,386**	**NA**	**2,125**	**NA**	**NA**	**5,559**	**4,223**	**NA**	**8,007**

Source: BRW, Inc

- There would be a need for and an expense for overnight security in remote staging areas.

Two concepts for intercepting day use private vehicle traffic and transferring passengers to a visitor transportation system were developed and evaluated.

- A system of staging areas in remote locations would intercept traffic on each route to the valley. Visitors would be carried on buses to the valley, where they would transfer to a circular system to reach individual destinations.

- A single staging area located in the valley would be served by a shuttle connector for access to Yosemite Village, where visitors could transfer to a circular system.

Two alternative remote staging area plans were developed to represent the range of potential options in this concept. One plan located staging areas outside the park near the south entrance, in El Portal near the west entrance station, and near the north (Big Oak Flat) entrance station. It was assumed that travelers to the valley from the east entrance (Tioga Pass) would be directed to the north staging area.

The second plan located staging areas in the park at Badger Pass and Crane Flat and outside the west entrance in El Portal. The Crane Flat staging area was assumed to serve Tioga Pass traffic bound for the valley. The two remote staging area concepts are illustrated on the accompanying map.

Table D-2 compares the remote staging area alternatives with an in-valley staging area. The in-valley staging area was assumed to be located at Taft Toe for this comparison.

The remote staging concept would require 7 to 10 additional acres for parking development, 40 to 62 additional buses, and $10.8 to $16.5 million in additional operating costs per year. The total cost increase for remote staging compared to in-valley staging ranges from $13.2 million to $20.2 million annually.

Remote staging areas would offer a potential benefit by reducing private vehicular travel throughout the park. However, significant decreases in private vehicle use would be achieved only for visitors who enter and exit Yosemite via the same gate and do not visit other activity areas in the park. Only 21% of the current visitors to the valley make this type of visit. Most valley visitors would make private vehicle trips along the same routes traveled by the shuttle systems after visiting the valley, offsetting the private vehicle travel savings associated with remote staging areas.

Other considerations favoring an in-valley staging area strategy include:

- Remote staging areas would limit visitors' ability to stop at features along the park roads for sightseeing and other activities.

- Potentially higher levels of particulate and nitrogen oxide (NO_x) emissions would be generated by buses.

- Increased noise levels would be associated with high volumes of bus travel.

- Complex visitor communications and management systems would be necessary at many sites to sort nonvalley, valley day use, and valley overnight traffic. Similar functions would need

TABLE D-2: COMPARISON OF REMOTE AND IN-VALLEY STAGING AREAS FOR YOSEMITE VALLEY ACCESS

Comparative Measure	Staging Areas Outside Park	Remote In-Park Staging Areas	Taft Toe Staging Area
Number of parking spaces	2,720	2,470	1,840
Number of buses required	83	61	21
Construction and equipment cost	27,337,000	$21,692,000	$10,864,000
Annual operating and maintenance cost	$21,639,000	$15,190,000	$3,158,000
Average delay to through travelers (in minutes)	132	97	23

Source: BRW, Inc.

Note: Accommodates day use only. Costs represent total costs (contingency, planning, and supervision percentages applied where appropriate) for vehicle fleet and parking spaces only. Does not include valley circular VTS.

to be accommodated at the entrance to the valley as well as the remote staging areas.

As a result, the analysis of VTS options for Yosemite Valley assumed an in-valley staging area site.

Several staging area site alternatives in Yosemite Valley were identified and analyzed:

- Pohono Quarry
- Valley View
- Bridalveil Falls area
- Yellow Pine
- Camp Six (Sentinel Bridge)
- Old Curry dump site
- Taft Toe (El Capitan crossover)

The Camp Six, Curry Orchard, and Curry dump sites offer little opportunity to reduce private vehicle traffic because they are toward the east end of the valley, including:

- no impact to sensitive views into or within the valley
- no impact to Merced River floodplain or wild scenic river designated area
- adequate land area to accommodate surface or structured parking and additional visitor services and administrative facilities
- most convenient access from and egress to parkwide road network
- convenient visitor access management for overnight and day users

Private vehicle travel, bus travel (assuming that a shuttle connection between the staging area and Yosemite Village and Yosemite Lodge would be provided by buses) and VTS capital and operating costs for the Taft Toe site were compared to those for the Yellow Pine and Pohono Quarry sites. Table D-3 shows the key findings of this comparison.

The Pohono Quarry site would minimize private vehicle travel, since it would intercept all day use valley visitors entering from the north and west at the west end of the valley. The Yellow Pine site would generate the highest volume of private vehicle travel, since all visitor trips would traverse the valley loop as far east as Sentinel Bridge on their exit route. The Taft Toe site would generate substantially lower private vehicle volumes than those for Yellow Pine but higher than those for Pohono Quarry.

The private vehicle travel reductions possible with the Pohono Quarry site would e achievable only with an expanded VTS fleet and higher VTS operating costs. A bus-based VTS connection from the staging area at Pohono Quarry would require over 5,200 daily

TABLE D-3: COMPARISON OF VALLEY STAGING AREAS

Comparative Measure	Pohono Quarry	Yellow Pine	Taft Toe
Private vehicle miles traveled per year in valley	905,538	7,582,854	3,325,560
Bus vehicle miles traveled per year in valley	1,408,900	531,800	877,100
Total vehicle miles per year	2,329,800	8,113,300	4,202,000
Bus fleet capital cost	$6,525,000	$3,480,000	$4,567,500
Annual bus fleet operating cost	$5,072,100	$1,914,400	$3,157,700

Source: BRW, Inc.

Note: Assumes shuttle connection between staging area and Yosemite Lodge via Camp Six using bus technology Accommodates day use visitors only. Bus fleet cost represents total cost (contingency percentage applied).

bus miles, compared to 3,200 at Taft Toe and 2,000 for Yellow Pine.

A guideway technology employing electrically powered vehicles would eliminate the noise and emissions impacts of a Pohono Quarry staging area. Such a system would be 2.5 miles longer for the Pohono Quarry site than for Taft Toe. The capital cost increase for a guideway connection from the quarry compared to Taft Toe would be $78.2 million. Annual operating costs would also be substantially higher for a fixed guideway system serving the quarry.

Although Pohono Quarry offers the potential for significant reductions in private vehicle travel, the travel reduction benefits of this site would be balanced by negative impacts on Discovery View and higher development costs for parking due to the need for a parking structure. Increased management staff and facilities would be required to confirm overnight reservations and limit day use vehicle access at the El Capitan crossover. There would be greater impacts on the Merced scenic river corridor and higher capital and operating costs for the visitor transportation system.

Considering its advantages and the drawbacks of the other potential sites, for the purposes of this study Taft Toe was assumed to be the site for a staging area for day use visitors to Yosemite Valley.

The final valley visitor access alternatives consisted of a staging area and a transportation system comprised of two shuttle routes. Day use visitors arriving by private vehicle would be intercepted at a staging area located at the El Capitan crossover located in the Taft Toe area. Tour buses bringing day use visitors into the valley would proceed to Camp Six, where a bus parking area would be provided. As an option, day use tour bus passengers could be dropped off and their buses parked at the Taft Toe staging area.

Overnight lodging guests and campers would drive their vehicles to their accommodations, where they would remain parked for the duration of the visitors' stay in the valley. Tour buses with overnight guests would drop passengers off and pick them up at lodging facilities and then park close to the lodging area, at Camp Six, or at the staging area. The staging area could include an overnight visitor check-in facility, where reservations could be confirmed. Visitors awaiting accommodations on a stand-by basis could be served at this facility. The valley visitor transportation system could be clearly explained to all visitors.

The first shuttle route (valley connector) would provide service between the staging area and the Yosemite Lodge/Yosemite Falls area via Southside Drive and the Sentinal Bridge crossover. Stops would be made at the major activity points along the way in each direction. The second shuttle route (valley circulator) would serve the east end of the valley,

traveling between the Ahwahnee Hotel and Happy Isles Nature Center, using the Sentinel Bridge crossover and Southside Drive. A transfer point between the two routes would be provided in the vicinity of Camp Six, and each route would serve the village. Day use tour bus passengers would have access to both routes at the Camp Six transfer station.

Four technology options were developed for each shuttle route: standard bus, articulated bus (passenger trams could also be considered), light rail transit (LRT), and an elevated people mover using group rapid transit (GRT) technology. Light rail transit would be constructed at grade most probably adjacent to the exiting road, although it would be possible to construct the system in the road, where it would share the lanes with vehicles. LRT vehicles would be powered by electricity delivered by an overhead wire.

GRT options would involve the construction of an elevated guideway 16 to 17 feet above the valley floor. GRT vehicles would be electrically powered by a special contact rail located in the guideway or by linear induction motors that would operate with electrical current in the guideway. The GRT system would require elevated stations with elevators for access for people with disabilities and stairs or escalators for general visitor access.

The system of day use visitor access and circulator service for all visitors would require supporting actions for success. Along with the new staging areas and the VTS routes, the following improvements and modifications to current operations would be required:

- Visitor parking would be removed from all activity areas except for reserved parking spaces at lodging sites and campgrounds. Limited parking would be provided for access for people with disabilities. Short-term parking for campers shopping at the Curry Village store could be considered in the Curry Orchard. Overnight visitors would be informed of parking limitations and the use of the valley shuttle system after they reached their overnight destination.

- More services would be provided at Curry Village to direct visitor-related demand away from the store in Yosemite Village.

- Some or all visitor center functions would be relocated to the Taft Toe staging area. At a minimum, visitor information, orientation and interpretation, and restroom facilities would be provided at the staging area. Confirmation of overnight reservations would be required for lodging, camping, and backcountry users. Day users would also have to check-in if reservations are implemented for valley day use. Fast- food services, concession-operated gift sales, and service station functions could be located at the staging area. Bike rentals could be provided to reduce shuttle demand. For the LRT and GRT options, vehicle storage and maintenance would be located at Taft Toe. The bus alternatives could use Taft Toe or another location for vehicle storage and maintenance.

- Camping and the stable would be relocated from the north side of the Merced River to reduce habitat fragmentation and streambank damage and provide wildlife access to the stream from the north. The river campgrounds and group camp would be affected by the relocation, which would allow closure and removal of Stoneman Bridge. Shuttle alternatives that would allow the facilities to remain are shown as staging options at the end of the executive summary.

- Northside Drive would be closed to visitor traffic between Sunnyside Campground and El Capitan crossover. Closure of Northside Drive would also be possible from El Capitan crossover to Pohono Bridge if Southside Drive was upgraded to four lanes. This would remove visitor traffic from all of the north side of the valley except for the short stretch between Yosemite Lodge and Ahwahnee Hotel. The roads on the north side would be retained for NPS needs and bicycle traffic only.

The proposed valley alternatives all offer significant potential benefits to visitors, resources, and park management. Visitor access would be improved by providing a centralized parking facility with clear information and efficient access. The proposed alternatives would eliminate the need for all day users to negotiate the confusing valley road network in search of scarce parking spaces. Visitor experience would be enhanced by removing the disrupting influence of traffic congestion, roadside parking, and scattered formal parking facilities. Transit service levels would be very good, with short wait times and reduced crowding on vehicles compared to the existing shuttle system. The reliability of service would be improved by reducing delays from traffic congestion.

The valley's resources would benefit from the ability to remove visitor and VTS traffic from long sections of Northside Drive, affording improved wildlife access to the Merced River and reduced streambank damage from overuse by visitors. Traffic would be reduced by 77% (see table D-1), which would decrease emissions and lessen the potential for contamination of the Merced River from particulate matter and accidental fuel spills.

Park management would be facilitated by focusing day use parking in a central location and by eliminating the need for traffic control staff during peak traffic conditions. Management of visitation to GMP levels would be simplified by limiting the supply of day use parking to the number of spaces needed to support the prescribed visitation. If a day use reservation system were implemented, the proposed staging area site would facilitate the confirmation of reservations for both day and overnight visitors.

All of the alternatives would require a substantial area for parking at Taft Toe. While over 1,800 new parking spaces would be developed at Taft Toe to accommodate day users, an equivalent number of parking spaces could be removed from more sensitive areas in the east end of the valley. The site would not be visible from the key viewpoints at Discovery View and Glacier Point and could be screened from the Merced River by locating the facility away from the Southside Drive. The development could be located out of the Merced River floodplain and would not disrupt critical meadow and meadow edge habitat. Site-specific archeological surveys would be required prior to any ground disturbance activities for construction of a staging area (see the Yosemite Valley VTS alternative map).

The service characteristics and visitor management opportunities for the valley alternatives are similar, with the exception of the need for stairway and elevator access to elevated stations for the GRT alternative. The elevated stations would make access to the systems less convenient, particularly for visitors with recreational equipment. The bus options would influence visitor experience by increasing bus noise levels and by resulting in more frequent vehicle arrivals and an almost constant shuttle bus presence. Specially configured buses could be used to reduce noise. Future developments in battery and hydrogen fuel cell technology could eliminate engine noise. The overhead wires that provide power for the LRT alternative would disrupt some foreground views and the views of some features from points along the guideway. The elevated guideway of the GRT alternative would have a major impact on foreground and longer distance views and would most likely be visible from Glacier Point.

The resource impacts of the options are similar, although the LRT and GRT options would involve major construction in the archeological district and the potential for intermittent impacts on air and water quality associated with construction. These alternatives would require a large maintenance facility in the valley (probably at the staging area), while the bus maintenance facility could be located out of the valley (if substantial increases in operating costs were acceptable). The bus alternatives would be the least costly to implement and operate but would require a larger operating staff. The highest cost option would be group rapid transit, followed by light rail transit. Both of the guideway transit options are significantly more costly than the bus alternatives. The LRT and GRT options would be the most complex to implement, requiring more extensive environmental documentation and specialized expertise for design and construction. Electrification upgrades would be required in the valley to deliver the necessary amount of power in both the LRT and the GRT options. The bus alternative could serve as an initial step in a multiphase development of a fixed-guideway system. Because of the very high ridership potential for the proposed systems, the cost per visitor is quite low compared to systems in other settings, ranging from $1.40 per visitor for the bus options to over $10.50 per visitor for the GRT option. Table 4 summarizes the cost for two bus alternatives and the LRT and GRT options. A mix of bus and guideway systems could also be implemented with a corresponding reduction in costs.

RELATED VISITOR MANAGEMENT MEASURES

The majority of the transportation impacts in the major activity areas are associated with day use visitation. The enforcement of GMP visitation goals is difficult in the valley due to the dispersal of parking areas and lack of an effective checkpoint where entries and exits can be monitored.

A day use reservation system would aid in the management of visitor use; however, without a means of checking entering traffic to confirm reservations and a place for safe and efficient diversion of visitors to areas of lower use or out of the park, implementation of a reservation system would not be practical. Controlled access points served by parking areas sized to

correspond to the applicable visitor volume would make a reservation system workable. The system could reduce the number of visitors turned away from activity areas and would cut down on unnecessary traffic into and through the park, especially if information could be provided to visitors as they travel on the major access routes toward Yosemite.

Facility total costs represent a net cost estimate plus 16% (of net) for contingencies, 15% (of net) for supervision and 25% (of net) for planning.

Intelligent vehicle/highway system (IVHS) technologies could be applied to the development of visitor management concepts, including reservation systems. Advance traveler information systems using signs, radio, or in- vehicle terminals could be used to advise potential visitors of the up-to-the-minute status of lodging, camping, and day use reservation availability in Yosemite. These systems would be most effective for Yosemite visitors if located at the intersections of roads leading to the park with California Highway 99 and U.S. 395. Such traveler information systems, in combination with reservation centers located at the major access points to the roads serving Yosemite, would allow visitors to plan a Sierra vacation itinerary based on the availability of access to the park. A cooperative association of Yosemite National Park and the surrounding counties of Merced, Mariposa, Tuolumne, Mono and as well as the California Department of Transportation and the U.S. Forest Service, has been formed to improve visitor information regarding overnight accommodations, park access and other recreational opportunities, using Intelligent Vehicle Highway Systems.

Providing current information to visitors along California Highway 99 and U.S. 395 would afford visitors opportunities to change their travel routes, park entry points, or overnight plans. Providing information on park accessability and the ability for visitors to make next-day reservations could eliminate unnecessary travel and support the economic development objectives of the communities.

The gateway communities now serve as overflow overnight lodging resources for visitors who would otherwise stay in the park. As visitation to Yosemite increases, more visitors would be expected to stay overnight in the gateway communities. Some trips to and from the park by visitors staying in the gateway communities could be served effectively by shuttle systems. Shuttle services could be provided by an association of lodging operators as an incentive to visitors. The successful implementation of shuttle systems serving overnight guests outside the park could reduce the number of parking spaces required for day users at the valley staging area to some degree.

IMPLEMENTATION AND FUNDING OPTIONS

The staging area and VTS improvements analyzed in this study would take several years to be planned, designed, and constructed. In the interim, the number of days with unacceptably high levels of congestion is likely to increase.

Some short term improvements to better serve visitors are possible in Yosemite Valley. Visitor access could be improved by developing Camp Six as a formal day use visitor parking area. By providing a paved and striped lot, the capacity of the facility could be improved substantially. The Camp Six parking area could reduce demand on the overloaded shuttle system by providing pedestrian access to the village for day users.

The long-term VTS recommendations for the valley focus on the elimination of day use vehicle trips and simplification of the existing valley shuttle bus system for more efficient service. Along with service improvements, visitor use of some valley roads and bridges could be eliminated and visitor facilities could be relocated to allow habitat restoration.

Implementation of the long-range transportation system could be accomplished in three stages.

Stage I

- develop Taft Toe staging area, including relocation of visitor information center from Yosemite Village
- implement valley connector shuttle along Southside Drive (or modified to be raised out of the meadows along south hillside) to connect the Taft Toe staging area with Yosemite Lodge
- implement valley circulator shuttle between the Ahwahnee Hotel and Happy Isles via Yosemite Village, Housekeeping Camp, and Curry Village

TABLE D-4: COST SUMMARY FOR YOSEMITE VALLEY VTS ALTERNATIVES

Cost Element	Standard Bus	Articulated Bus/ Passenger Tram	Light Rail Transit	Group Rapid Transit
Construction and equipment (millions)	$26.4	$26.2	$279.1	$458.5
Annual operating and maintenance (millions)	$4.7	$3.3	$5.9	$5.3
Annual GMP visitors	4,049,502	4,049,502	4,049,502	4,049,502
Annualized cost per visitor	$1.76	$1.38	$7.05	$10.51

Source: BRW, Inc.

Note: Equipment total costs represent a net cost estimate plus 16% for contingencies. No supervision or planning cost percentages are applied.

- develop shuttle transfer point and tour bus parking at Camp Six
- relocate main valley visitor store to Curry Village; maintain village store for employees and some visitors at Yosemite Village
- eliminate visitor traffic on Northside Drive between El Capitan crossover and Yosemite Lodge; maintain emergency and service vehicle accessibility; use road for pedestrian and bicycle circulation

Stage II

- relocate upper and lower river campgrounds if suitable sites can be identified; restore campground areas to natural conditions
- eliminate all traffic on Stoneman Bridge road between Curry Village and the Yosemite Village intersection

Stage III

- widen Southside Drive to four lanes from Pohono Bridge to the El Capitan crossover
- eliminate visitor traffic from Northside Drive between El Capitan crossover and Pohono Bridge
- provide designated El Capitan viewing and climber access parking area on the north side of the El Capitan crossover
- relocate stables south of the Merced River if a suitable location can be found; restore stables area to natural condition
- relocate Group Camp and North Pines Campground to area near relocated river campgrounds if a suitable site can be identified; restore area to natural conditions
- terminate shuttle traffic at Happy Isles or at Mirror Lake shuttle shop

The implementation of any of the VTS alternatives evaluated in this study would require new funding. Potential sources include funding provided in the Intermodal Surface Transportation Efficiency Act, line-item appropriations as part of the NPS budget, participation by the park concessioner; and user charges, which would be collected as part of the entrance fee. The systems would work best if fares were not charged. Direct user charges are not recommended. Funding could be generated through modest increases in entrance fees. The fixed guideway VTS options in the valley would require funding from sources other than users. Investment in these systems could better preserve the valley's valuable natural and cultural resources.

APPENDIX E: GIS ANALYSIS

BIOTIC RESOURCE ANALYSIS

The biotic resources map was constructed by combining information on wildlife habitat, vegetation, wetlands, and the Merced River management zone.

The wildlife data was derived from park observations and U.S. Fish and Wildlife Service records of threatened and endangered species. Nesting areas with buffers were mapped and valued. Nesting areas were given a resource value of five; outside buffers were given a value of three.

Vegetation was mapped into 40 classes using infrared photographs and ground surveys. For analysis, vegetation types were classified relative to their resource sensitivity. These determination were based on:

sensitivity to human impact
resiliency
pristineness
degree to which the type represented or supported an exceptional native community
abundance of the type in Yosemite Valley

There are no known federally or state-listed plant species in the project area.

The wildlife/habitat relationships were derived by park staff from the vegetation data. It was necessary to combine these vegetation classifications into broader groups in order to use the habitat types found in the California Department of Fish and Game Wildlife Habitat Relationship (WHR) system. To determine resource sensitivity values, a formula was used that incorporated species diversity, the number of threatened and endangered species, and the scarcity of a habitat in Yosemite Valley. This data is only being used for early guidance in determining placement and removal of developments. More site-specific inventories would be completed before development could begin.

All wetlands information was derived from the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI). For the *Draft Valley Implementation Plan*, it was recognized that no new development would take place in wetlands, so they were screened out. More detailed wetlands surveys would be completed as part of the design of projects.

The Merced River management zone was defined as a buffer on both sides of the river where facilities would be removed and no development would take place.

SCENIC RESOURCE ANALYSIS

The scenic resources map was constructed by combining the GMP scenic areas, important viewsheds, and the wild and scenic river corridor.

During the preparation of the *General Management Plan*, all areas in the valley were mapped into three categories based on the historical and contemporary views of each area. These categories are:

A — scenic (valued five for the GIS analysis)

Areas include the scenic views commonly chosen by eminent early photographers and painters or included in the most significant scenic views today (includes all meadows and the Merced River).

B — scenic (valued three for the GIS analysis)

Areas include the scenic views less commonly chosen by historic photographers and painters or that compose less significant modern views.

C — scenic (valued one for the GIS analysis)

Areas include those with little scenic quality that could accept visual intrusions without detracting from either primary or secondary vistas.

Two of the most prominent valley viewpoints are Glacier Point and Tunnel View. A viewshed analysis from these viewpoints into the valley was completed and valued at three.

The Merced wild and scenic river corridor was given a value of three for analysis. This corridor was determined to include the floodplains of the Merced River, Tenaya Creek, and Yosemite Creek for the east end of the valley and 0.5 mile on either side of the river to the dam impoundment.

CULTURAL RESOURCE ANALYSIS

The cultural map includes ethnographic resources, cultural landscapes, and archeological resources.

Ethnographic resources (the Native American use areas) were mapped in 1994. These areas included gathering areas, spiritual areas, villages, and sites. They were all given a resource value of four.

The cultural landscapes were mapped from the *Cultural Landscape Report*. Historic districts, roads, and trails were all valued. The national landmarks, such as the Ahwahnee Hotel, rangers' club and La Conte Memorial, were all screened out.

Archeological resources were mapped in 1993. These areas were all given a resource value of four.

PHYSICAL RESOURCE ANALYSIS

The physical map was created from a geohazards map, the Merced 100-year floodplain map, and the valley soils map.

The geohazard maps were composed using 1978 and 1993 USGS data. Rockfall zones were given a value of five; historic and prehistoric rockslides were given a value of five. Deposition areas along streams were valued at four.

The 100-year floodplain along the Merced River was given a value of three. No new structures would be planned for the floodplain.

Soils information was gathered by the Soils Conservation Service in 1991. The 26 soils were evaluated for their resource value based on criteria similar to vegetation:

sensitivity to human impact
resiliency
pristineness
degree to which the type represented or supported an exceptional native community
abundance of the type in Yosemite Valley
slope

APPENDIX F: AIR QUALITY

AMBIENT AIR QUALITY STANDARDS — NATIONAL AND STATE

Pollutant	Averaging Time	California Ambient Air Quality Standards	National Ambient Air Quality Standards
Ozone	1 hour	0.09 ppm	0.12 ppm
Carbon Monoxide	8 hours 1 hour	9.0 ppm 20.0 ppm	9.0 ppm 35 ppm
Nitrogen Oxide	Annual Average 1 hour	___ 0.25 ppm	0.053 ppm ___
Sulfur Dioxide	Annual Average 24 hours 3 hours 1 hour	___ 0.04 ppm (105$\mu g/m^3$) ___ 0.25 ppm	80 $\mu g/m^3$ (0.03 ppm) 365 $\mu g/m^3$ (0.14 ppm) 1300 $\mu g/m^3$ (0.5 ppm) ___
Suspended Particulate Matter (10 Micron)	Annual Geometric Mean 24 hours Annual Arithmetic Mean	30 $\mu g/m^3$ 50 $\mu g/m^3$	___ 150 $\mu g/m^3$ 50 $\mu g/m^3$
Sulfates	24 hours	25 $\mu g/m^3$	___
Lead	30 days Calendar Quarter	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Source: Derived from *Area Designations for State and Ambient Air Quality Standards*, September 1993, California Air Resources Board.

MARIPOSA COUNTY AIR POLLUTION CONTROL DISTRICT PERTINENT AIR QUALITY REGULATIONS

Regulation Number	Description
Regulation I	Definitions
Regulation II	Prohibitions
Regulation III	Open burning
Regulation IV	Authority to construct
Regulation V	Permit to operate
Regulation VI	Fees
Regulation VII	Hearing board procedure
Regulation VIII	Air quality zoning
Regulation IX	Nonvehicular air toxics
Regulation X	Title V permit procedures

HUMAN HEALTH EFFECTS OF CRITERIA POLLUTANTS

Pollutant	Chronic Exposure Effects	Acute Exposure Effects
Ozone - O_3	irreversible reduction in lung capacity, lowers stamina, more vulnerable to long term respiratory problems, changes to immune system, children, elderly and those who suffer from heart or lung disease are most susceptible	adds stress to body in general, strong irritant, may restrict airways causing more stress on the respiratory system, coughing, chest pains, headaches, nausea, asthma attacks, eye and throat irritation
Carbon Monoxide - CO	restricts blood's ability to carry oxygen to the brain and other body tissues, aggravates heart and lung disease, impairs central nervous system, fatigue and decrease in physical and mental performance	causes dizziness, nausea, headaches and fatigue, reflexes are slowed, judgement and visual perception are impaired, extremely subtle and dangerous
Nitrogen Oxide NO_x	damages cell linings in the respiratory tract and increases susceptibility to infection, irritates lungs and causes bronchitis and pneumonia	airway narrowing, cell membrane damage, fluid leakage, contributes to bronchitis and pneumonia
Particulate Matter - PM_{10}	7 year national study shows a 17% increase in deaths from respiratory and heart disease in polluted cities compared to clean cities. An estimated 60,000 people die prematurely in the United Sates each year from particulate air pollution	aggravates existing respiratory disease and damages lung tissue, alters defense system
Sulfur Dioxide - SO_2	causes respiratory illness, alters lung defenses, affects breathing	aggravates existing respiratory and cardiovascular disease
Lead-Pb	readily absorbed into the bloodstream and attacks central nervous system, children are especially vulnerable	adversely affects mental development and performance, kidneys, liver, blood forming organs, the nervous system and blood pressure

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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